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and saw for the first time in my life males of *Heptamelus hectus* indulging in their usual dance over the herbage in a little clearing alongside the path. I boxed a few and some common geometrids, disturbed from the bushes as I passed, and determined that that would not be my last visit to that wood! Since then I have spent very many happy hours collecting there in various ways, generally single-handed, but sometimes with the late Arthur U. Battley (of whom it was a favourite haunt) and other friends, and had my first experience of salting and autumn treacled. In those days pheasants were found in the wood, and several times I was scared by one of them rising on the wing from almost under my feet after dark! On one occasion I was collecting some larvae of *Chrysomela neustria* from a crab-apple tree a few yards off the path, and was told by the keeper to return to the latter as I was trespassing! In those days, too, nightjars used to frequent the more open parts of the wood, and I have often been regaled with their unique churring whilst mothing at dusk. It is a good many years since the keeper ceased from troubling, but it is not so very long since I was again requested to return to the footpath, this time by the shooting tenant of the wood (who lived at Chingford), though what he found to shoot I couldn't make out, as the pheasants were things of the past, and there were no rabbits. Presumably it was wood-pigeons, which were fairly plentiful at times. Of late years we listened to the nightingale singing in one of two fairly thick bits of cover left when the wood was severely cleared of undergrowth during the war. I believe the Chingford Urban Council are contemplating the acquisition of the wood, such as it is now, as a permanent open space, so its entomological interest will, doubtless, be no more heard of, and therefore I think it will be desirable, and perhaps of some historic value in time to come, to compare this wood entomologically with Ongar Park Wood.

The latter covers an area of about 300 acres and is nineteen miles from Charing Cross; Lark's Wood is only eight miles from Charing Cross and covers only about 25 acres. Both woods have the advantage of being neighboured by other woods, including Epping Lower Forest in the case of Ongar Park Wood, which also has Coopersale Common, with its area of swamp nearly adjoining; on the other hand, Lark's Wood is not so well favoured in this respect, though it has Higham's Park, with a small piece of Epping Forest and two small woods about half a mile away. Ongar Park Wood, has, therefore, much the best of it in respect of area, distance from London, and surroundings. It is also much better furnished with birches, aspens and willows, but Lark's Wood had an abundance of wild service in the form of one or two trees and a lot of scrub and bushes. The trees have long been cut down and much of the scrub

has gone. Lark's Wood consists primarily of two small hills, on which there are some well-grown beeches; between these elevations runs the footpath from the Hale End entrance through the narrowest part of the wood, and joins a footpath which skirts the N.W. side of the wood and runs to part of South Chingford. The S.E. side of the wood is partly bounded by the road from Hale End to Chingford, and from the hedge on this side I beat my first specimens of *Cidaria fulvata* in 1885, there being then a good deal of wild rose in it as well as hawthorn and sloe. The hedge on the N.W. boundary used to be good for larvae of *Plemyria bicolorata* and the moths in good variety flew along it at dusk. In the palmy (!) days of the wood willows were fairly plentiful, several of the bushes being only some 5 or 6 ft. in height and therefore conveniently workable when in flower. Just inside the entrance to the wood were a few elms, and just outside several well-grown willows. At the other end of the path were some hazel and guelder rose bushes, and common maple was scattered about with wild raspberry in one place. There was also a solitary and small spindle-tree alongside the path in a rather shady spot, but it used to suffer badly from attacks by a *Hyponomeuta*, and finally died under the strain of being defoliated every year! The principal trees in the wood were young oaks, and there were enough of these sufficiently close to the path to be convenient for treacling along its whole length. There is a small farm at the entrance to the wood, and this, with cultivated fields of root and other crops at the other end, accounted for a good diversity of species.

The three "whites" were generally common in the usual proportions, and *Aglais urticae* and *Chrysophanus phlaeas* were not uncommon. *Eugonia polychloros* was once seen, and *Vanessa io* and *Pyrameis atalanta* occasionally. *Epinephele janira* occurred now and then in the grassy clearings, where *Pamphila sylvanus* was also sometimes seen.

Besides *Hepialus hectus* already mentioned, *lupulinus* was also very common, as were, of course, *Spilosoma lubricipeda* and *menthastri*, and *Porthesia similis* fairly so whilst on July 20th, 1887. I was agreeably surprised to take two *Calligenia miniata* in broad daylight flying along the path at some height in its usual manner; this was the only time I saw this species in the wood. Long before dark also I used to take plenty of *Angerona prunaria* in good variety of colour and pattern. In 1886 and 1887 *Comibaena pustulata* was not uncommon in July, being at its best at the beginning of the month, and flying along the path at about 7 ft. up long before dusk. *Phalaena syringaria* was also occasionally taken at dusk, and the larvae beaten from honeysuckle, which was common in the wood. *Ourapteryx sambucata*, *Opisthograptis luteolata*, *Iodis lactearia*,

Hemithea aestivaria, *Asthena albulata*, *Scopula biselata* and *floslactata* (*remutata*), *seriata* (*virgularia*), *aversata* (in variety), *Cabera pusaria* and *exanthemata*, *Abraxas grossulariata*, *Xanthorrhoe fluctuata* and *montanata*, and *Euphyia bilineata* were all abundant. *Campaea margaritaria* was occasionally seen, and sometimes came to treacle! *Boarmia repandata*, *Cosymbia porata* and *punctaria*, *Calothysanis amata* (*amataria*), *Scopula imitaria*, *Hydrelia flammeolaria* (*luteata*), *Calostigia didymata*, *Perizoma flavofasciata* (*decolorata*), *Euphyia corylata*, *Lygris pyraliata*, *Dysstroma truncata* and *citrata* (*immanata*) were much less common, and *Epirrhoë alternata* (*sociata*) was by no means abundant. The only "pugs" I noticed were *Eupithecia castigata* and *exiguata* and *Chloroclystis rectangulata*, the first named being the commonest. *Pelurga comitata* turned up occasionally: *Hydriomena furcata* (*elutata*) was common, and sometimes visited the treacle, whilst *Earophila badiata* was usually seen at fallows. Of the winter and spring group I never met with any in the perfect state except *Erannis leucophaea* and *marginaria* and *Operophtera brumata*, all of which were, as usual, very much more in evidence in the larval state. *Phigalia pedaria*, *Biston betularia*, *Erannis aurantiaria* and *defoliaria* were seen only in the larval state, as was also *Colotois pennaria*. The only "Cuspidate" I ever met with was *Cilix spinula*, which was commonly seen flying at dusk and often fell into the tray during larva-beating.

Deltoids were represented by *Hyppena proboscidalis*, *Zanclognatho tarsipennalis* and *grisealis*, the last-named being frequently seen on the treacle. Of Pyralids, *Endotricha flammealis* and *Pyralis costalis* (*fimbrialis*) were common on treacle in the autumn, and I can remember evenings when they were the only species seen! *Eurrhypara urticata* (*urticalis*) and *Notarcha ruralis* (*verticalis*) were as common as usual amongst nettles, and *Mesographa forficaris* and *Phlyctaenia sambucalis* were occasionally seen near the farm, where cabbages and elder were present in the garden. *Scoparia mercurella* was the only other Pyralid noticed, and was as common as usual.

The Noctuae as a whole were well represented, and the majority revealed themselves on the treacle patches. *Habrosyne detersa* and *Thyatira batis* were as skittish and capricious in their appearance and behaviour as they usually are, and the first was sometimes netted when flying; but although birch, oak and aspen were present in the wood I never saw any of the *Palimpsestis* group. *Acronycta psi* was common on treacle (always as var. *suffusa* Tutt), and *A. rumicis* much less frequent. *Leucania comma*, *lithargyria*, *conigera*, *impura* and *pallens* were all very common at treacle, the last two being also frequently noticed flying amongst the herbage. *Chortodes arcuosa* was very common on treacle in July and August, 1887,

after two only had been boxed in 1886, but after that it seemed to disappear, for I never saw it there again. *Hydroecia nictitans* and *micacea* were sometimes seen on the treacle and occasionally also taken flying. *Axyia putris*, *Xylophasia rurea* and var. *combusta*, *lithoxylea* and *polyodon* were all common, *hepatica* less so, as was also *Dipterygia scabriuscula*. whilst *Cerigo matura* was an occasional visitor: *Mamestra brassicae* and *persicariae* were generally very common, but *sordida* was rather scarce. *Apamea didyma* was, of course, abundant and in very great variety; in fact, almost all the forms described in Tutt's *British Noctuae* were represented: *A. gemina* was common in the two forms *rufescens* and *intermedia-rufa* of Tutt; *A. unanims* was rarely seen. *Miana strigilis* very common, the forms being Tutt's *nigro-rufa*, *rufa*, *unicolor*, *fasciata* and *aethops*; *fasciuncula* and *bicoloria* were much less common than the preceding and very uniform in colouring. *Giammesia trigrammica* not common, but the form *ap proximans* occurred in the proportion of about 1 to 6 of the ordinary form. *Caradrina morpheus* was fairly common, *alsines* and *blanda* rarer. *Rusina tenebrosa* fairly common in the early 'nineties of last century. *Agrotis puta*, *suffusa* and *nigricans*, all rare and occurring usually as single specimens on the treacle patches perhaps once in a season; *segetum* fairly common and not variable. *A. exclamationis* common. *Triphaena ianthina*, *fimbria* and *orbona* were rare and usually occurred as single specimens on treacle; *pronuba* was extremely common and very varied. *Noctua augur*, *plecta*, *tranquillum*, *brunnea*, *baja*, *rubi* were all fairly common on treacle; *c-nigrum* much less so, and *festiva* much more so; *xanthographa* was, of course, abundant and very varied, and *umbrosa* was rare, to the extent of perhaps one in a season. Speaking of *augur* reminds me that I once found about 10 specimens under a large piece of loose bark on a standing oak in a small wood at Chingford Hatch in the daytime. This wood was exactly a mile from Lark's Wood and would probably have been interesting to collect in, but it was not so convenient to work as there was no footpath through it, and I never tried it.

On the sallows *Taeniocampa gothica*, *stabilis* and *cruda* were very common, *gracilis* and *incerta* much less so, and *Pachnobia rubricosa* occasional, and always of the form *rufa*; there were probably not enough aspens to attract *populeti*, which I never saw there. *Orthosia* was represented by one *lota*, but this species was not uncommon on ivy on Chingford Old Church and tombstones about a mile away. *Anchocelis* was represented by *pistacina* and *lunosa*, both common. *Orrhodia vaccinii* and *ligula* were both common, and *Scopelosoma satellitia* was abundant and mostly of the var. *rufescens* Tutt, with white, yellow or red reniform. *Mellinia circellaris* was

fairly common on treacle, which *Citria flavago* visited once. *Cosmia trapezina* was very abundant and in great variety, from pale ochreous to nearly black, including banded forms; *diffinis* and *affinis* were both fairly common in the late 'eighties and *affinis* more so in 1892, after which both became very scarce. *Dicycla oo* turned up in small numbers in the late 'eighties, and was common in 1898 on treacle in The Sale, a green ride bordering Higham's Park, and again in fair numbers in 1901, but I saw nothing of it in Lark's Wood in those two years.

I never saw any trace of a *Dianthorcia* in the wood, although there was a good patch of red campion on which no doubt *decolorata* above mentioned used to feed up. *Miselia oxyacanthae* was very common and in good variety, including *capucina*. *Brotolomia meticulousa* and *Euplexia lucipara* were, of course, common. *Aplecta nebulosa* was pretty common round about 1890, and all were of the typical grey form. Now I come to what is probably my best capture in Lark's Wood, viz. a dark specimen of *Eurois occulta*, which I boxed on treacle about the year 1900 (see *Entomologist*, xlviii, p. 21, for this and other Essex captures of this species). *Hadena oleracea* was, of course, common, but *protea*, *dentina*, *pisi*, *thalassina* and *genistae* were all scarce and were always seen as odd specimens only. *Xylocampa lithorhiza* was usually taken on tree trunks or at sallows, and was fairly common. *Plusia chrysitis* and *gamma* were both common, the former usually netted, but I never saw either of them visit the treacle as I have known *gamma* to do in the New Forest. *Scoliopteryx libatrix* was an occasional visitor to treacle, *Amphipyra pyramidea* and *tragopogonis* more frequent, but neither common. *Noenia typica* was generally common, but *Mania maura* and *Catocala nupta* were usually seen as single specimens, though I have seen two of the latter on the same evening. I paid practically no attention to the "Micros," so that to mention the species I came across is not worth the space necessary. I may say, however, that *Halias bicolorana* occasionally turned up on treacle, and *Tortricodes hyemana* was common flying in the sunshine about Easter, when also *Chimabache fagella* was common on the tree-trunks in all shades from white to black. The only "Plumes" I ever saw in the wood were *Mimoseoptilus pterodactylus*, which was common amongst the *Veronica chamaedrys* which grew plentifully in some parts, and, of course, *Acipitilia pentadactyla*.

Such is my record of some 160 species, which would have been trebled no doubt had the Tortrices and Tineae been included. It would probably compare unfavourably numerically and in quality with the Ongar Park Wood total, but taking all things into consideration I think it is not a bad list, and I can certainly say that

in the best period of my collecting there, say, from 1885 to 1900, treacling was quite as productive and exciting as Mr. James's experiences in Ongar Park Wood, for I, too, have known the treacle patches covered with scuffling crowds of moths, when 40 or 50 on a patch was no uncommon occurrence and plenty of variety was represented. No one, alas, is ever likely to have that experience in Lark's Wood in the future, for its glory has departed.

EPUNDA LICHENEA IN SUSSEX.—Barrett (*Brit. Lep.*, vol. iv, p. 288) says that *E. lichenea* is "apparently very rare in the south-east of England, and scarce even in Sussex," and in the list of Lepidoptera in the *Victoria History of Sussex* it is also said to be "very rare—reported from Abbot's Wood." It may therefore be of interest to put on record that in a small and inefficient light-trap, worked occasionally in a window of my house, seven specimens were captured between September 18th and October 12th last.—ROBERT ADKIN; Eastbourne, November, 1931.

PROCRIS STATICES, L.—In vol. ii of *Seitz's Macrolepidoptera of the World* Dr. Karl Jordan calls attention to the verification needed of recorded localities for the species of this difficult genus. I have recently had occasion to examine my own series of the above species, and giving it my best and most careful attention I cannot see that any specimen I had previously referred to it is anything but *statices*. That being so I might as well record that in June, 1902, I was in the Province or Principality of Waldeck Pymont and I there found *P. statices* in considerable abundance, mainly, however, confined to the hilltops—this I imagine is due to the fact that practically all available valley land was under food crops. The actual localities were as follows: At Polle on the River Weser in rich pasture on the plateau about 400 ft. above the river, which at this point is bordered westward by a cliff not unlike the eastern side of Cheddar Gorge; on the Bomberg Pymont at about 1060 ft. above sea-level in the waste margins between cultivation and the woodlands on the hillside; on the Königsberg at about 800 ft. in similar situations; on the Koterberg south of Polle-a-Weser from the end of the forest belt, say 1000 ft. up to 2500 ft. (the top of this elevation), in grass land much resembling the top of an English chalk down. Oddly enough I did not obtain the species in the pasture land at river level anywhere in the district. The formation was, I was there informed, Devonian. I doubted it then, but being unable to find anything to settle my doubts I mentally referred it to Carboniferous limestone or possibly Kimmeridgian. However, the entire district is calcareous, and such rocks as I saw were either a hard white or grey limestone, or a clay with a high calcium admixture. This bears out my experience in England that *P. statices* prefers calcareous to either argillaceous or silicious soils, notwithstanding that *Rumex acetosa* has a great liking for the acid silicious soils of this district (Dorset, E.).—W. PARKINSON CURTIS; Drake North, Sandringham Road, Parkestone, Dorset.

GENERIC NAMES AND GENERA.

BY LOUIS B. PROUT.

SOME recent contributions to the *Entomologist* dealing with the above two subjects* may serve to give some "indication" of the morass in which we are floundering, largely on account of the deplorable introduction of a highly indefinite word into Article 25a of the International Code of Zoological Nomenclature. It would be a waste of space to instance the absurdities which could justly be claimed as an "indication" of an author's intention. It is much more to the point to observe that the International Commission was soon pressed to give some more intelligible pronouncement, and in *Science*, October 18th, 1907, p. 522. the unanimous opinion in so far as it concerns generic names, is given in these words: "The word 'indication' in Art. 25a is to be construed as follows: (1) A bibliographic reference, or (2) a definite citation of an earlier name for which a new name is proposed, or (3) the citation or designation of a type species."

Clauses (1) and (2) are incontrovertible, inasmuch as they do not dispense with a definition of the genus, but merely separate the name chronologically from its definition, linking the two by "bibliographic reference" or "citation." Clause (3) is on a very different footing, because it does dispense with definition and thereby dispenses with the higher grade, merely associating a second name with the existing definition—the one already supplied by the description or figure of the species. I am bound to admit that as matters stand Mr. Talbot is justified in accepting type-citations in lieu of definitions. But, reading between the lines, I think I can see in the latest insistence on diagnosis (as from January 1st, 1931†) the beginning of a return to sound scientific practice, and "hold my hand" in anticipation of further corrections of method. I write "return" and "corrections" advisedly, because the necessity for definition was not only postulated by Linné and Fabricius, but was a live issue in the times of Latreille, Stephens and others more than a century ago.

What mischief has been wrought by the constant confusion of a "generic name" with a "genus" is shown clearly by the fact that so capable and well-informed an entomologist as Capt. Hemming can write under *Synchloë* that this "genus" was first published in the *Zuträge*, whereas he obviously means "generic name" as

* Vol. liv, pp. 227-232, "On the Status of Some Generic Names in the Family *Pieridae*," by G. Talbot; *l.c.* pp. 272, 273, "On the Types of Certain Genera of the Family *Pieridae*," by Capt. A. F. Hemming.

† Zoological Congress, Budapest, 1928, amendment to Art. 25.

elsewhere. We know that Hübner was working out a "generic" scheme (in our modern sense) for the *Verzeichniss*, and he very unwisely used his manuscript names for such species as he happened to be wanting to figure in the *Zuträge*. At times, quite casually, he refers by way of comparison to some well-known European species in the same coitus, a positive proof that he is not yet dealing with it *qua* coitus.

In any case, the throwing together of species under a common heading—as *Mancipium* in the *Samml. Exot. Schmett.*, or *Leptosia* in the *Zuträge*—does not furnish "the citation or designation of a type species," therefore (as given by Talbot) the first characterization constitutes in each case the valid erection of the genus.

It is only those who have delved rather deeply into zoological literature who realize the chaos which would result from the attempt to give every chance binomial a claim to influence generic nomenclature. Manuscript names picked up in a museum and used through pure inadvertence, such as *Chlorinthia* Kaye, *Trans. Ent. Soc. Lond.*, 1901, p. 147; misspellings not recognized as such, e.g. *Ereuxa* Hedem., *Hor. Soc. Ent. Ross.*, xvi, p. 247 [bis] (err. pro *Eremia*), which actually found its way into our British Museum as a prior name for *Nyssiodes* (!); manuscript names suppressed by their author but used by another, such as *Cosmophyga* Dogn., *Ann. Soc. Ent. Belg.*, lvi, p. 138; these and scores of others will constantly be discovered blocking our path, and rendering still more impracticable the already difficult task of securing generic stability.

UNUSUAL EMERGENCE OF CUCULLIA LYCHNITIS.—In August, 1930. I collected a few larvae of the above species and kept the resultant pupae in a cold damp outhouse. Four emerged normally in May, 1931, the rest apparently lying over in the pupal state. To my astonishment I found that a fine male had emerged on November 6th. Surely this is most unusual? The sudden warmth after a period of abnormal cold may have had something to do with it.—P. A. CARDEW (Lt.-Col.); Hilsea Lodge, Cosham, Hants.

EUROIS OCCULTA IN S. HANTS.—On August 24th last I took a fine male of this species at rest about 3 p.m. on a post on the downs near here. I am told that this is worth recording; I have not been able to trace any previous record from S. Hants myself, though possibly it may have been taken before. I see the species is reported as unusually plentiful in Norfolk this past season by Mr. C. W. V. Gane in the *Entomologist* for November. My specimen is of the pale grey ground-colour with clear markings—a type which, I believe, is usual in the south.—P. A. CARDEW (Lt.-Col.); Hilsea Lodge, Cosham, Hants, November 12th, 1931.

SCRAPTER, A MISUNDERSTOOD GENUS OF BEES.

BY T. D. A. COCKERELL.

As long ago as 1825, Lepeletier and Serville proposed a genus *Scrapter* to include three species from Caffraria. Vachal in 1897, designated *S. bicolor* Lep. & Serv. as the type, but without having seen it. Different authors attempted to identify *Scrapter* Friese, regarding it as the valid name for *Ctenoplectra*, while I have formerly treated it as equivalent to *Macropis*. Still again, it has been considered a subgenus of *Andrena*. Some time ago, having occasion to write on African *Ctenoplectra*, I was obliged to reconsider the position of *Scrapter*, and from a study of the descriptions, reached the conclusion that it was the genus *Strandiella* of Friese.* This is a Diphaglossine genus of South Africa, unlike anything in the northern hemisphere. This remained little better than a guess until Mr. R. Benoist, at my request, looked for the types of Lepeletier and Serville in the Museum at Paris. There he found them; they had stood all these years without names, but were easily recognizable by the locality labels, and agreement with the descriptions.† When I visited Paris last summer I examined these specimens, and found that, as Mr. Benoist stated, one was an *Allodape* but the other two pertain to *Strandiella*. My notes are as follows:

Allodape punctata (Lep. & Serv.).

♀. Type. Expanse almost 15 mm.; face with three yellow bands, and a yellow stripe along posterior orbits, the latter departing from orbit above; thorax anteriorly, tubercles and pleura with long or conspicuous fox-red hair; scutellum smooth, orange, with anterior and posterior margins black; stigma large, lower section of basal nervure curved; hind tibiae and tarsi with red hair, extremely bright on tibiae behind; abdomen dullish, hind margins of first two tergites narrowly brownish.

Scrapter bicolor Lep. & Serv. (type of genus).

♂. Type. Length about 11.5 mm.: head and thorax hairy, in bad condition but hair pale; head broad, with broad face; flagellum thick, ferruginous above and beneath, and stigma dark rufous; lower section of basal nervure nearly straight, falling short of the oblique nervulus; second cubital cell very long, receiving first

* *Rev. Zool. Bot. Afr.*, xviii (January, 1930), p. 358.

† *Ann. Mag. Nat. Hist.*, July, 1930, p. 49.

recurrent nervure more remote from base of cell than second recurrent from apex; legs black, tarsi red at apex, hair on inner side of hind basitarsi light; abdomen broad, naked above. without bands, first three tergites bright red, first dark at base; other tergites black, the margins obscurely reddish; apical plate reddish, broad. broadly rounded at end, but parallel-sided; apex and penultimate ventral segments with black hair.

This differs from *S. niger* in the variation, thus:

- First recurrent nervure more remote from base of second cubital cell than second from apex; hind wing with externo-medial nervure from cross-vein (nervellus) to origin of cubital nervure not much longer than cubital nervure from externo-medial to cross vein (intercubitellus) *bicolor*, L. & S.
 First recurrent nervure much less remote from base of second cubital cell than second from apex; hind wing with externo-medial nervure from cross-vein to cubital nervure much longer than cubital nervure to intercubitellus *niger*, L. & S.

Scrapter niger Lep. & Serv.

♂. Type. Length about 9.3 mm.; in very bad state; face broad, densely covered with long hair, orbits converging below; flagellum moderately long, thick, obscurely reddish beneath; mandibles cannot be clearly seen, but appear pale; thorax very hairy, the hair very pale ochreous; mesothorax moderately shiny, finely punctured: stigma ferruginous, large; second cubital cell receiving second recurrent nervure nearly twice as remote from apex as first from base; lower section of basal nervure nearly straight, falling far short of nervulus; outer side of third discoidal cell quite straight; tarsi rather dull red, also middle tibiae at base and apex; anterior tibiae light ferruginous, also spot on anterior knees; area of metathorax poorly defined, with a rugosopunctate surface; abdomen rather narrow, shining, hairy, not banded, tergites laterally swollen before the pallid margins.

S. bicolor is nearly the same as *Strandiella rufiventris* Friese, but that has red anterior tibiae. and in some specimens the middle tibiae are also red, and there is a black spot at each side of second tergite (male). The first tergite may be largely black or all red; mandibles have a dark red band. The *S. rufiventris* examined (in British Museum) are from Rapenburg, Cape Flats (*Turner*).

S. niger is similar to *Strandiella pallidipennis* Ckll. from Bulwer, and agrees in the recurrent nervures. *S. pallidipennis* is rather smaller, with highly polished mesothorax. The genus *Scrapter*, including the bees hitherto assigned to *Strandiella*, includes the following species. The species ascribed to Brauns are only known to me from the characters given in Friese's table (1924), and I am not aware that they were otherwise published.

<i>Scrapter bicolor</i> (Lep. & Serv.).	<i>Scrapter luteipennis</i> (Fries).
„ <i>caffra</i> (Brauns).	„ <i>niger</i> , Lep. & Serv.
„ <i>divergens</i> (Brauns).	„ <i>pallidipennis</i> (Cockerell).
„ <i>erubescens</i> (Fries).	„ <i>rufescens</i> (Fries).
„ (♂ of <i>rufiventris</i>).	„ <i>ruficornis</i> (Cockerell).
„ <i>flavipes</i> (Fries).	„ <i>rufiventris</i> (Fries).
„ <i>fuscipennis</i> (Fries).	„ <i>sanguinicollis</i> (Brauns).
„ <i>glaverrimus</i> (Fries).	„ <i>sphecodoides</i> (Fries).
„ <i>longulus</i> (Fries).	

In 1916 I designated *Strandiella longula* as the type of *Strandiella*.

THE HABITS AND DISTRIBUTION OF *LASPEYRESIA CONICOLANA* HEYLAERTS.—In June, 1931, I visited the New Forest for a fortnight to find out as much as possible concerning the newly differentiated British Tortricid, *Laspeyresia conicolana*. The weather was exceedingly bad during the whole period. I only had one day without rain, but as luckily the moth was found to fly in all weather conditions except when heavy rain was falling, I was able to see a fair number and map out its distribution to a certain extent. Although not found wherever pines occur, *conicolana* is to be obtained in patches throughout the Forest in the triangle between Lyndhurst, Beaulieu, and Brockenhurst, though I only found it at all commonly in one small grove of Scotch firs. As, however, it frequents the higher boughs of the trees, it is quite possible it is common in some of the tall groves, where I found only an occasional specimen on the lower boughs. It chiefly affects the Scotch fir, though I took a few specimens in groves of Austrian Pine. On dull days after a high wind it may be beaten early in the morning from the lower boughs of the trees, but on a sunny day it begins to fly about 11 o'clock and makes its way to the tree tops, where it dances about the higher boughs, dropping from point to point with a somewhat heavier flight than that of *L. cosmophorana*. On the wing it looks much darker than that insect; in both flight and colour it much more resembles *L. ochsenheimeriana*. On a dull day the flight commences soon after noon. It is the most active member of the genus I have observed so far, having a short flight in the afternoon even on cold and rainy days, when it would be hopeless to look for either *cosmophorana* or *ochsenheimeriana*. Pairing appears to take place soon after noon, as I beat several pairs in cop. about 1 o'clock in the daytime. The normal flight is considerably higher than that of the other two species, which, in my experience, like to skirt the lower boughs of the pines; to make certain of a bag of *conicolana* it is advisable to have a fishing-rod to which to fix the net frame.—H. C. HUGGINS; 5, Windsor Avenue, Cliftonville, Margate.

MEIGEN'S "NOUVELLE CLASSIFICATION."

BY F. W. EDWARDS, Sc.D.. F.E.S.

IN the year 1800 there was published in Paris a pamphlet with the title, "Nouvelle Classification des mouches à deux ailes (Diptera L.). d'après un plan tout nouveau. Par J. G. Meigen," the pamphlet consisting of very brief diagnoses of 88 named genera of Diptera, with an introduction by Baumhauer and a preface by Meigen. This pamphlet remained almost unknown until the year 1908 when the generic names and diagnoses in it were re-published by Hendel, who pointed out that the diagnoses corresponded more or less closely with those in Meigen's *Versuch*, published in 1803, although most of the names were different. By a comparison of the two papers Hendel was able to interpret the earlier set of names, and proposed that these should be given priority over those of 1803, which until 1908 had been in general use among Dipterists.

Some writers followed Hendel's lead, but other declined to do so, the grounds of their objections including the following :

(1) Doubt as to whether the 1800 pamphlet was ever actually published.

(2) Doubt as to whether Meigen was the author of the pamphlet or only of the "plan," (Meigen never again wrote in French. or referred to the pamphlet in any way).

(3) Inconvenience of altering such a large number of well-established genera and family names of Diptera.

(4) Absence of any mention of specific names in the 1800 pamphlet.

(5) Inadequacy of the 1800 diagnoses, and impossibility of interpreting most of them without reference to the paper of 1803, where genotypes are mentioned (*i.e.* interpretation only possible *after* 1803).

The matter was brought to the notice of the International Commission on Zoological Nomenclature, who, on examination, established the fact of publication and authorship by Meigen, and gave their opinion as follows (Opinion 28): "The generic names contained in Meigen's 'Nouvelle Classification,' 1800, must take precedence over those in his *Versuch*, 1803. in every case where the former are found valid under the International Code." The Commission, however, seem only to have considered the question of publication without discussing the other objections noted above. It is not clear from the International Code, or from Opinion 46 of the Commission, whether genera published without species are to be dated from their original publication, or from the time when species were first mentioned in connection with them; if the latter, the validity of the "Nouvelle Classification" names dates only from 1908.

On this point a sentence in Baumhauer's introduction seems particularly significant. After referring to the difficulty he had in persuading Meigen to publish his work he says: "Je . . . finis par le persuader de publier . . . une espèce de prodrome, qui pourroit servir d'introduction à l'ouvrage, et qui, pour ne pas anticiper sur ce dernier, ne contiendrait absolument que les genres." It seems clear that Meigen's own view was that genera published without species were not nomenclatorially valid, and that he himself wished the 1800 names to be ignored.

In view of these considerations many Dipterists have felt that in spite of the opinion expressed by the Commission the "Nouvelle Classification" should be disregarded, and some even of those who at first adopted the names have reverted to the use of the 1803 genera. Others have regarded the Commission's "opinion" as binding and have used the 1800 names whenever they have been available.

Uniformity of practice in this matter is highly desirable, and it has been suggested that one way in which more general agreement might be arrived at would be to ask for a definite special ruling of the International Commission on Zoological Nomenclature annulling the "Nouvelle Classification." Before any such step is taken it has been thought advisable to obtain the opinions of Dipterists throughout the world, and replies are therefore invited to the following questions:

1. Do you consider that the names in the "Nouvelle Classification" should be accepted?
2. Do you consider that the omission of specific names renders the "Nouvelle Classification" names invalid?
3. Do you consider that, whether or not the "Nouvelle Classification" names are valid under the International Code, they should be annulled?

Replies should be sent as soon as possible to me at the British Museum (Natural History), London, S.W. 7. If a large number of affirmative answers are given to question 3, the matter can be brought before the International Entomological Congress in Paris in 1932.

RETARDED EMERGENCE OF DICRANURA VINULAE.—With reference to the notes on this subject in the last volume of the *Entomologist* (pp. 258, 281), from about 30 larvae taken at Hayling Island in June, 1912, I had a female emerge on May 21st, 1915. The specimen was somewhat smaller than the average, but otherwise normal; I had allowed the hard outer cocoon to remain unbroken, as otherwise I have usually found the pupae to succumb. I remember the late Dr. A. E. May, who had bred this species at Hayling for a number of years, informed me that he had two recorded instances of females remaining in the pupal state for two winters.—J. G. BRYANS; Knells, Carlisle, December 5th, 1931.

A SYNOPSIS OF THE BRITISH HYMENOPTEROUS
FAMILY CYNIPIDAE.

BY CLAUDE MORLEY, F.E.S., F.Z.S.

(Continued from vol. lxiv, p 250)

Sub-family ALLOTRIINAE.

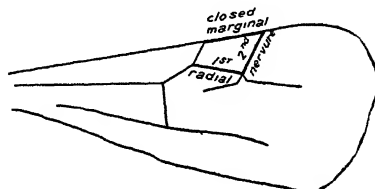


TABLE OF GENERA.

- | | |
|---|---------------------------|
| (4) 1. Notauli at least partly impressed upon mesonotum. | |
| (3) 2. Scutellum bi- (<i>Anoloxysta</i> , Thoms.) or uni-foveate; notauli entire | i. <i>Phaenoglyphis</i> . |
| (2) 3. Scutellum not foveate; notauli incomplete (no spp.) | <i>Hemichrysis</i> . |
| (1) 4. Notauli utterly wanting. | |
| (6) 5. Radial cell closed in front by marginal nervure | ii. <i>Allotria</i> . |
| (5) 6. Radial cell without nervure along front margin | iii. <i>Allorysta</i> . |

Genus i: PHAENOGLYPHIS, Först.

Table of Species.

- | | |
|--|--|
| (4) 1. Radial cell's second abscissa only double length of the first. | |
| (3) 2. Scutellum glabrous; testaceous, abdomen darker | 1. <i>xanthochroa</i> , Fst. |
| (2) 3. Scutellum pubescent; black, legs and antennae paler | 2. <i>salicis</i> , Cam., and 3. <i>obfuscata</i> , Kieff., <i>Bull. Soc. Nat. Hist. Metz</i> , 1902, p. 16. |
| (1) 4. Radial cell's second abscissa $2\frac{1}{2}$ as long as first | 4. <i>forticornis</i> , Cam. |

P. xanthochroa is a distinct species in its strong notauli and close radial cell, of which the second abscissa is barely double the length of the first; it is certainly rare in the wild state, and the indigenous specimen known in 1893 was thought to have come from the "south of England"; my sole ♂ was swept on June 7th, 1903, at the River Staunch at Brandon in Suffolk, while collecting with

Chitty, Verrall, Tomlin and Collin. From it *P. forticornis* (*Ent. Mo. Mag.*, 1888, p. 210: "first abscissa two and a half times length of second," *sic*), from Devon and Yorks, differs in little beyond its elongate radial cell, paler head and abdomen. Mr. C. J. C. Pool bred a ♀ on June 19th, 1916, at Enfield in Middlesex from the indurated skin of an *Aphis* (apparently the common *Siphonophora urticae*, Kalt.), after it had been stored in a nest of the Fossor, *Pemphredon lethifer*, Shuck.

Genus ii: ALLOTRIA, Westw.

Conspectus Specierum.

- | | | |
|------|--|---|
| (20) | 1. Two apical flagellar joints, and abdominal segments, not connate. | |
| (19) | 2. Radial cell, and its nervure normal. | |
| (14) | 3. Second radial abscissa distinctly longer than first, or the cell $1\frac{1}{2}$ times as long as broad. | |
| (7) | 4. Antennae often shorter than body; second abscissa often straight. | |
| (6) | 5. Second abscissa one-fourth longer than first | 1. <i>megaptera</i> ; 2. <i>flavicornis</i> ;
3. <i>ruficollis</i> ; 4. <i>victrix</i> ; and 5. <i>circumscripta</i> . |
| (5) | 6. Second abscissa hardly one-third longer than first | 6. <i>minuta</i> . |
| (4) | 7. Antennae longer than body; second abscissa curved. | |
| (11) | 8. Radial cell much, and antennae slightly longer with joints of ♂ curved. | |
| (10) | 9. Antennae longer; scape rising from facial tubercle | 7. <i>curvicornis</i> . |
| (9) | 10. Antennae shorter; scape not tuberculate | 8. <i>ancylocera</i> . |
| (8) | 11. Radial cell much, and the normal antennae slightly, shorter. | |
| (13) | 12. Apical flagellar joint $1\frac{1}{2}$ as long as penultimate | 9. <i>dolichocera</i>
(? and 10. <i>collina</i>). |
| (12) | 13. Apical joint not longer than penultimate | 11. <i>longicornis</i> . |
| (3) | 14. Second radial abscissa hardly longer than first, or the cell hardly longer than broad. | |
| (18) | 15. Apical radial abscissa curved. | |
| (17) | 16. First abscissa shorter; discoidal nerve wanting | 12. <i>pleuralis</i> . |
| (16) | 17. First abscissa longer; discoidal nerve indicated | 13. <i>ruficeps</i> . |
| (15) | 18. Apical radial abscissa straight | 14. <i>Tscheki</i> . |

- (2) 19. Radial cell semicircular, its nervures
 incrassate 15. *Mullensis*.
 (1) 20. Two apical joints, and abdominal seg-
 ments, connate 16. *microcera*.

Cameron's faulty colour-chart for the discrimination of these insects relates rather to pigmental varieties than distinct kinds: and though I am persuaded we have far fewer species than these sixteen indicate, we certainly do find a good deal of discrepancy in the structure of the radial cell, by no means consistently described by the above author and consequently difficult of application. Thus in a series of obviously conspecific ♂♂, bred together during June 20th to 29th, 1909 (? through the Braconid, *Praon abjectum*, Hal., a few of which also emerged) from ♀♀ of the Aphid *Siphonophora sonchi*, Linn., already parasitized by April 22nd, 1909, on *Centaurea nigra* in my Monks Soham paddock, not only do some show the radial cell of *A. victrix*, Westw., and some that of *A. Tscheki*, Gir., but one example exhibits the divergent forms in its dexter and sinister wings! Along with them emerged at the same period two or three of the brachypterous *Cynips pedestris*, Curtis (*Xystus cursor*, Htg. et Marshall. *Bracon. d'Europ.*, xix, fig. 7), which is surely merely a dimorphic form of, and equally common in Britain with, *A. victrix*, though typical of Förster's "genus" *Nephycta*. To the last also belongs the British *N. Marshalliana*, Kief., *Wien. Ent. Zeit.*, 1900, p. 114, doubtless relegatable to the same category. Again, a pair of *Allotria*, named *erythrocephala*, Westw. (*recte* Htg. = *victrix*, Westw.), by Dr. Sigismund Brauns, individually display the same diversity of radial structure; they were bred together on August 20th, 1895, at Painswick in Glos. by C. J. Watkins from the accompanying indurated skins of the "Cabbage Aphid," *A. brassicae*, Linn. The dimorphic form *peditris*, though known to Cameron solely from Scotland, is not uncommon along all southern England, *e.g.* Surrey (Dr. Capron) and Suffolk, where it occurs during the middle of both June and September at the roots of plants in sandy places at Brandon and Barton Mills on the west of the county and on the east at Southwold, where it is sometimes swept from *Aster tripolium* in salt-marshes.

Bignell, in Devon, whose collection of Cynipidae went to the Plymouth Museum in 1907, abundantly demonstrated the hyperparasitic economy of the Allotriinae* through Braconids by breeding

* Such hyperparasitism was quite unsuspected by Buckton, who knew curiously little of Allotriinae, for he appears aware of the rearing of but a single specimen by Guérin from *Aphis rosae*, and reared one other specimen himself from one of the plum Aphides, and certainly not *Aphis amygdali*; but the latter *Allotria* is unnamed by him (*Mon. Brit. Aphid.*, ii, 1879, p. 150), *pace* "*Allotria amygdali*, Buckton," given with ref. cit. in *Genera Insectorum*, fasc. ix. Both Guérin's and Buckton's specimens were doubtless *A. victrix*, Westw.

"*Nephycta*" *pedestris* from *Aphidius urticae*. Hal., and *A. avenae*, Hal.: *Allotria victrix* from *Aphidius rosae*. Hall, and *A. pascuorum*, Marsh.; *Allotria minuta*, Htg., from *Aphidius sonchi*, Marsh, and *A. ribis*. Hal.: *Allotria flavicornis*, Htg., from *Aphidius cerasi*, Marsh. and *Alloxysta Ullrichi*, Gir., from *Praon volucre*. Hal.: as well as raising *Allotria ancylocera*, Cam., *A. longicornis*, Htg., *A. Tscheki*, *Allorysta basinacula*, Cam., and *A. perplexa*, Cam. from unnamed Aphidiine Braconids (*Trans. Devon. Assoc.*, xxxiii, 1901, p. 692). I have some *Allotria minuta*, Htg., variable in both the shape of radial cell and colour of legs and body, that were bred at Leeds University from *Siphonophora granaria*, Kirby, on August 8th, 1925, with no observed Braconid.

However commonly bred, in a wild state examples of both this and the next genus are certainly rare: I have captured barely thirty in as many years' collecting. Those of *Allotria*, excepting *A. curvicornis*, Cam., from Clare Island (*Proc. R. Irish Acad.*, 1911. xxiv, p. 18), are not likely to represent more than a couple of species: *A. minuta* has turned up at Monks Soham on lime leaves among the common Aphid, *Pterocallis tiliae*, Linn., on May 24th, 1908, and on house windows throughout August, where I took on August 13th. 1925, the hardly distinct *A. circumscripta*, Htg.; and the *A. victrix-Tscheki* species has appeared from early May to mid-June at Brandon in Suffolk, where in 1907 I swept three together from *Vicia sativa*, as well as in late August. 1923, at Monks Soham and in mid-September on the wing at St. Olave's near Lowestoft; while the rather paler form, *A. flavicornis*, Htg., was beaten from a hazel bush on June 27th, 1923, at Thorndon in the same county.

(To be continued.)

NOTES AND OBSERVATIONS.

DEPRESSARIA BRUNNELLA, Rag., AN ADDITION TO THE BRITISH LIST (LEP. TINEINA).—On August 20th, 1916. Mr. J. E. Eastwood was collecting among marram at New Romney in Kent when he shook out a *Depressaria* which later on he gave to me, as he was not collecting the Tineina. I took it up to the British Museum, where Mr. Stringer identified it as almost certainly *D. brunneella*, Rag. A few months ago I sent it to Mr. Meyrick with other moths for examination, which with his usual kindness he carried out, confirming this identification—an addition to our British list. Mr. Meyrick has kindly supplied the following description of my specimen and note:

"*Depressaria brunneella*, Rag.—♂, 23 mm. Head, thorax rosy-whitish somewhat mixed fuscous. Palpi rosy-whitish, second joint suffused dark fuscous, with rough projecting scales beneath diminishing to apex, terminal joint with blackish basal and supramedian bands. Fore wings rather elongate, 2 remote from angle; red-brownish, suffusedly mixed whitish; base of dorsal edge whitish, margined above by dark fuscous suffusion; several short dashes of

indistinct dark fuscous irroration in disc; a rather acute-angled whitish post-medial transverse shade in disc, followed by a series of short dark fuscous dashes; a marginal series of irregular dots of dark fuscous irroration round posterior part of costa and termen, preceded by short whitish dashes; cilia whitish-brownish, a fuscous antemedial shade, tips whitish. Hind-wings 5 connate with 3 and 4; whitish-grey, suffused light grey posteriorly; cilia whitish-grey."

"Quite a distinct species, recognizable primarily by its large size and red-brownish colouring, with paler head and thorax. Probably very local, and attached to some less common Umbellifer or Composite. Recorded, so far as I know, only from Lardy in France; I do not know where that is, nor is it included in the very comprehensive gazetteer of the *Times Atlas*."*

The specimen will be found with my collection at the National Museum of Wales in Cardiff.—ARTHUR F. GRIFFITH; 3, Evelyn Terrace, Brighton, November 12th, 1931.

PACHYCNEMA HIPPOCASTANARIA: TIMES OF APPEARANCE.—In the issues of February and May, 1931, I recorded the capture of *Pachycnema hippocastanaria* in the winter months. It is evident that the times of appearance of both imago and larva are very imperfectly known, or that these vary in different localities or seasons. In South's *Moths of the British Isles* the season for the larva is given as June and July and again in the autumn, and of the imago as April and May with a second brood in August; the August moths are stated to be usually small in size and in number. Meyrick's *Revised Handbook of British Lepidoptera* gives September–April for the larva and May for the imago, no mention being made of a second brood. I have no personal knowledge of the larva. I find the spring brood of moths far from plentiful: I have had only two examples at light, on April 17th and 27th, 1929, and in the course of long and frequent walks on the heaths in spring have never kicked one up. The second generation is on the wing as early as July 8th, and is over early in September: the moths are common then at light and may be disturbed in numbers by day. I can detect no difference in the size of the moths of the different broods. In addition to these two normal broods it is now clear that there is, in some years at any rate, a third emergence or partial emergence. Miss A. R. Molineux, of Eastbourne, has very kindly given me her experiences of the insect (in the New Forest, I believe). She writes: "I am inclined to think that in mild weather during the winter a few occasionally emerge from the September larvae, which normally should not do so until the following April or May, the majority remaining as pupae until then. On September 14th, 1929, I knocked nine half-grown larvae off heather; unfortunately all but one died. That one fed up quickly and pupated. I expected the imago to emerge in April or May of the following year, instead of which it emerged on November 16th of the same year (1929). The pupa had been out of doors the whole time, in a cold place on the north side of the house—in fact a place where I usually winter all my pupæ, but the weather had been mild. On July 21st

* Seine et Oise.—Ed.

this year I took a freshly emerged *hippocastanaria*, also a worn one. Two days later, on the 23rd, two full-fed larvae were found, and that night the imagoes were abundant, but mostly worn. I have taken one or two in the first week of May but have never really worked for them then." It is a curious fact that in no year have I seen the moth after the dying off of the normal second brood until January, though I have frequently had large bags of other moths in my trap in October and November, and they have been afforded every opportunity of coming in to light in the house whenever the nights permit of open windows between September and January. I had two specimens at light on April 7th, 1931, in third-rate condition; I do not know whether these had hibernated, or were very early examples of the ordinary spring brood—I incline to think they had hibernated. What, I wonder, happens in the case of these third-rate moths? Presumably they breed, but when do their progeny fly? Perhaps other entomologists can throw further light on the matter. Miss Molineux ends her letter with the very interesting remark: "I have known *P. gamma* emerge in mild weather in January."—H. L. ANDREWES; The Warren, Bere Regis, Dorset.

PHRYXUS LIVORNICA.—This year will doubtless be long remembered as a "*livornica* year" a special feature being the number of wild larvae found in various parts of the south coast and occasionally well inland. It would be interesting to know what proportion of these larvae pupated and produced imagoes, also, the treatment given to secure this desirable result. It would appear from my personal experience that unless meteorological conditions favour a rapid development of the imago, artificial assistance, in the case of this species, is absolutely essential. In company with Mr. A. J. Wightman I found three larvae on *Gallium mollugo* during a visit to the East Kent Coast last July. Two were quite small; one progressed well for 7 days, when it refused to eat and died. I succeeded in getting the other small one through all its larval stages, and was much disappointed when it died underneath its food-plant, without forming a cocoon. The third larva was full fed when found and pupated a few days afterwards. The propensity of the larva of this species to wander when about to pupate, which has been observed by other collectors, was strikingly manifested in this case. For about 50 hours the larva did not cease to crawl round the breeding-cage, sometimes attempting to climb the side, when it would fall back and proceed as before. Finally the larva appeared to be getting exhausted, and fearing to lose it I contrived as an experiment to produce as nearly as possible in an open space in my garden a replica of its natural environment, having some shingle available and *Galium* close at hand. I had previously loosened the surface of the soil, and the larva, when placed on the food-plant, quickly left it, crawled some 4 or 5 ft. in a straight line and commenced to burrow through the shingle and into the soil. I then transferred the larva back into the breeding-cage, and curiously enough, it continued its preparations to pupate without a break, making a small hollow in the soil, in which

it pupated, after covering it with a light web spun from particles of its food-plant. It seems reasonable to conclude from this that these perambulations are solely prompted by a desire for freedom, and are not instinctive in character. At the end of the seventh week the imago showed signs of development, faint markings appearing through the pupal wing-cases. A fortnight later the pattern was clearly defined, and the pupa, originally light brown, changed colour, becoming greyish black. It remained in this condition for two days, and the imago emerged during the night of October 11th. The pupa was kept in a cold greenhouse during the day, the temperature varying between 60° and 70° F. At sunset, the cage in which it was contained was brought indoors and placed in a warm room, the minimum temperature during the night being 60° approx. The pupa throughout was kept perfectly dry. I may add that Mr. Wightman found several larvae on the same occasion (recorded in the *Entomologist's Record Journal of Variation*, p. 142), and experienced the same difficulty with the small ones. None of these was reared, but others, full fed when found, duly pupated, after the "wandering" period to which I have referred, and five specimens of the perfect insect were obtained. —G. W. WYNN; The Old Cottage, Buxted, Sussex.

RECENT LITERATURE.

Der Ökologie der Blattminierenden Insektenlarven. By Dr. MARTIN HERING (*Zoologische Bräusteine*). Band 1, Heft 2, 1926.

Parasitism is a fundamental fact of life. It is a particular aspect of the general phenomenon of association of organisms. It is inevitable that we should interpret the relationships of different kinds of organisms living together in terms of human constants. When these latter are not clearly applicable we fail to understand the relationships. But parasitism does not fall into this category. It involves two organisms, of which one is said to be "attacked" and the other "attacking." The former is the "host," whose disintegration is the condition that enables the latter, the "parasite," to live and create.

In the work under review Dr. Martin Hering has investigated the relationship between the plant leaves and the insect larvae that live in the mines they make in them. The work is divided into sixteen chapters, covering 253 pages. The author begins by defining and describing the structure of a mine produced by an insect in a leaf, and goes on to consider the following aspects of this large problem: The mines in leaves and in other parts of the plant; the permanent and temporary miners; the mine constructors of various groups of insects; the egg-laying habits of the mining insects; the course of the mines; the larva in its relation to the mining work; the duration of the mines and change of mines; the transformation of the miner into the imago; the food-physiology of the leaf-miner; the disposal of the excrement of the miners; the colour phenomena of the mines; the life of the miners in water-plants; enemies of the miner;

inquilines and symbiosis; beneficial and harmful miners; galls; geographical distribution; and the breeding and identification of mining insects. The work is well illustrated by numerous text-figures and is accompanied by two plates one of which is in colour, and shows features of plant leaves under the attack of insect larvae. There is also a representative bibliography of 482 titles, which should be very useful to those who are engaged in research on this subject. Although a miner lives a sheltered life, it is not always in a bed of roses. It is much handicapped by the lack of free movement as far as its enemies are concerned. Confined within a limited space, possibly the miner copes with its enemies by reacting in directions which may not be in accordance with our general expectations of behaviour. Dr. Martin Hering's work should stimulate further research concerning miners of plant leaves, such as the larvae of certain Hispine beetles, which include serious pests of palms, rice, grasses, bamboos and other plants useful to man. If Dr. Martin Hering's work is important from the point of view of economic entomologists, it is no less so for those who study the interesting ramifications of the web of life from a less severely practical, a more detached, and perhaps philosophical aspect. S. MAULIK.

The Standard Natural History. Edited by W. P. PYCRAFT, F.L.S.
London: F. Warne & Co. Pp. xiv + 942. Text illustrations;
12 plates in colour. 15s. net.

The aim of the publishers, as stated in the preface, is an attempt "to provide an adequate survey of the whole Animal Kingdom in a single volume." With the rapid extension of our knowledge of Zoology in recent years such a task might well appear impossible of attainment; nevertheless it is a pleasure to be able to congratulate not only the publishers, but the editor and his twelve distinguished contributors, on a remarkably successful achievement. The volume of nearly 1000 pages, enlivened by twelve coloured plates and over 900 half-tone and line-block illustrations, if a trifle heavy in the literal sense, is, metaphorically, quite the reverse, and to anyone with a taste for natural history it will provide many a delightful hour of pleasant and profitable study. Whilst the non-scientific reader will be able to follow congenially the almost infinite adaptations of life in its innumerable forms, and gain some insight into the conceptions of evolution, the specialist will derive equal satisfaction from the perusal of clear and authentic accounts of those orders of the animal kingdom which he has not leisure to study in detail. The types for description and illustration have been admirably selected, and though primarily intended as a popular account, we can confidently recommend the book to the young student as an educative relief from the somewhat hackneyed examples which still do duty in some of our laboratories. Most of us have had the interesting experience of finding some living creature whose form and relationships have excited our curiosity. There are few such problems that could not be solved or at least illuminated by reference to the pages of this work, and it should find a place in every private as well as

public library. The great majority of the nine hundred or so illustrations are above criticism, perhaps the least satisfactory being those of the birds, which have had to be made from preserved specimens—never very life-like when photographed. Really fine colour-printing is still an expensive process, and one must not expect too much in a volume at so reasonable a price. The excellence of the plate of Coral Reef Fishes suggests, however, that the printer is not entirely to blame for one or two of the others which are rather less pleasing. The printing and make-up are alike good, and the work should have a ready and successful sale. H. E.

The Moths of Eastbourne: Part II. By ROBERT ADKIN. *Trans. Eastbourne N.H. Soc.* Vol. X. 2nd Supplement.

Mr. Adkin's remark that only just over 500 of the 1328 species known in Great Britain and belonging to the superfamilies dealt with in this volume have so far been recorded in his area reads almost like an apology; surely there can be very few districts that can make a better showing. The groups dealt with are the Pyralidina, Psychina, Tortricina, Tineina and Nepticulina, all of them deservedly popular with the collectors of a past generation, but sadly neglected nowadays in the mad quest for aberrations. Let us hope that such admirable productions as Mr. Adkin's may help to attract interest back again to more fruitful paths. The 112 pages of letterpress are accompanied by twenty-five really excellent black-and-white plates and a map of the district.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 21st, 1931.*—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Election of Fellow.*—The following was elected a Fellow of the Society: V. P. Vardé, B.Sc., D.-ès-Sc., Locust Research Laboratory, Agricultural College, Lyallpur, Punjab, India. *Exhibits.*—Dr. G. D. Hale (carpenter exhibited and made remarks on (1) *Acræa althoffi* and its models, including a new mimetic form; (2) an aberration of *Charaxes numenes*; (3) a variety of *Hypolimnas salmacis monteironis*. Mr. H. Donisthorpe exhibited a very rare insect from Windsor Forest (*Stenophylax dubius*, Stephens). Mr. J. A. Simes exhibited a series of *Agriades thetis* (*bellargus*) and ♀-f. *coelestis*, from Charente, France, in conjunction with which Mr. C. B. Smith also exhibited a series, captured in June, 1931. Mr. B. M. Hobby made remarks on the epigamic habits of *Empis opaca* (Diptera, Empididae). Prof. E. B. Poulton, F.R.S., made remarks on (1) the gregarious sleeping habits of a Heliconiine and an Ithomiine butterfly in Trinidad, observed by Mr. P. Lechmere Guppy; (2) a beautiful Geometrid moth new to Trinidad; (3) insect carriers of Orchid pollinia, collected by Col. M. J. Godfery.—S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*October 8th.*—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. H. W.

Andrews exhibited the rare Diptera *Didea alneti* and *Echinomyia ferox* from N. Kent and a series of *Tephritis bardonae* bred from burdock heads; Mr. Barnett, very dark *Coenonympha pamphilus*, the Kemsing race of *Plebeus aegon* and *Ephnephele jurtina* with extra spots on the underside; Mr. Niblett, galls on the flowers of *Solanum dulcamara*, of *Cardus crispus* and of *Senecio vulgaris* with the insects bred from them; Mr. H. J. Turner, a short series of *Heliothis peltigera* from W. Kent, and larvae of *Cilia glaucata*; Mr. Newman, *Pyrameis cardui* bred from larvae; Mr. Wakely, a very variable series of *Grapholitha nisella* bred from Effingham; Mr. Downes exhibited the moths taken on a camping tour with a car on the coast of Dorset and Devon, including *Plusia ni* (2), *Lithosia caniola*, *Agrotis lunigera*, etc., and communicated a note on the expedition; Mr. Hawkins showed a short series of *Lygis populata* with very dark forms from Braemar larvae, a very dark *Biographia pella* from Mitcham, and a pale *Polyphoca flavicornis* from Wimbledon; Mr. Grosvenor, second brood examples of *Zygaena stoechadis* derived from the south of France; Capt. Curwen, *Melitaea cinxia* from the I. of Wight in mid-June. Mr. S. N. A. Jacobs exhibited the larval cases of *Coleophora saturatella* and of *C. lineola* on broom and *Stachys* respectively, and also of *C. fuscadinella* on elm, and communicated notes on the larval habits; Mr. Eagles showed larvae of *Piguera pigra* from Epping and a series of *Abrostola tripartita*, including light forms; Mr. Blair, larvae of *Apamea gemina* on ribbon-grass. Mr. R. Adkin submitted a report of the Congress of the S. E. Union of Scientific Societies at Winchester in June last.—HY. J. TURNER, *Hon. Editor of Proceedings*.

ENTOMOLOGICAL CLUB.—Two meetings of the Entomological Club were held at Oxford, on October 3rd and 4th, with Prof. E. B. Poulton and Dr. Harry Eltringham respectively in the Chair. Members present in addition to the Chairmen: Mr. H. Donisthorpe, Mr. J. E. Collin, Mr. W. J. Kaye. Visitors present: Mr. J. H. Andrewes, Mr. E. Bolton-King, Dr. G. D. Hale Carpenter, Dr. F. A. Dixey, Mr. B. M. Hobby, Capt. A. F. Hemming, Sir Guy Marshall, Mr. A. J. Pomeroy, Capt. N. D. Riley, Dr. Hugh Scott, Mr. W. H. T. Tams, Comm. J. J. Walker, Mr. C. J. Wainwright. On Saturday afternoon the members and visitors assembled at the Hope Department, where Prof. Poulton and Dr. Eltringham assisted the party in the inspection of the collections, and tea was served by Mrs. Poulton. Apartments were provided for members and guests at Jesus College, where dinner was served each evening at 7.45 p.m. On Sunday, October 4th, the party made excursions to various places during the morning. After luncheon members and their guests journeyed by car in rather dull weather to Cothill, where a picnic tea was much enjoyed. During the afternoon some interesting Diptera were captured, but nothing else was on the move except a most virulent and innumerable host of midges. The meetings were very successful, quite in accord with the Oxford tradition, and the party duly broke up on Monday morning.—H. W.-E.

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[No. 825]

OBITUARY.

WILLIAM JOHN LUCAS, B.A., F.E.S.

(Plate I.)

THE New Year has been saddened for a wide circle of entomologists, and particularly for those connected with this magazine, by the death on January 5th, 1932, of William John Lucas. This occurred at Ringwood, Hants, where Mr. Lucas was staying with his brother. To those of us who knew him intimately the news came as a terrible shock, for although he had been somewhat indisposed of late, there seemed no cause for real anxiety, and it is difficult to believe that he is no longer with us. Mr. Lucas himself could have had little intimation of his approaching end, for, a few days before his death, he had arranged to meet the writer in London—a meeting which was not to be.

Born in 1858, he received his early education at an Oxford Grammar School. He took his Bachelor of Arts degree of London University in 1887. His teaching career began in 1880 at Tiffins' School, Kingston-on-Thames, where he became Senior Mathematics and Science Master, and where he founded the Tiffinian Natural History Society. He was also appointed lecturer in Nature Study to the Surrey County Council. His educational work was an outstanding success, marked by a great ability to impart knowledge, an inexhaustible patience, and a love for boys which continued after his retirement from professional duties in 1920 until his death. One of the early pioneers of the Boy Scout movement, he took a leading part in the organization at Kingston-on-Thames, and by means of lectures and exhibitions, and by taking an active part in their camp life, he became extremely popular with the boys, many of whom acquired, from his contagious enthusiasm for this subject, a lasting love of Nature. He never married.

He was elected a Fellow of the Entomological Society of London in 1898, and served on the Council from 1904 to 1906. In 1900 he was elected President of the South London Entomological and Natural History Society, and, judging from his published work, this was the society in which he was most active. He was also a member of the Hampshire Field Club, and of the Lancashire and Cheshire Entomological Society, occupying the office of Vice-President for some years in the latter society. In 1901 he joined the panel of editors of the *Entomologist*, and from that date until the day of his death he constantly rendered the magazine the very greatest assistance in every possible way.

Although a sound student of many branches of natural science, Mr. Lucas's chief interest lay in Entomology, and in this branch he fills an honoured niche among those who have contributed to its advancement. Very few orders of insects escaped his attention, but he was early attracted to certain groups that were placed by the older entomologists in the then very heterogeneous order Neuroptera. He confined his studies mainly to our native fauna, and the results are published in numerous papers and a very fine series of text-books.

Of the latter the most noteworthy are his monographs on *British Dragonflies* (1900) and on *British Orthoptera* (1917), and his last book, *The Aquatic (Naiad) Stage of the British Dragonflies* (1930). Two early books of a more popular nature were his *British Butterflies* (1893) and *British Hawkmoths* (1895). A complete list of his published papers would be too long to give here, and it is possible to notice a few only: On the Emergence of *Myrmeleon formicarius* from the Pupa (1906, *Trans. Ent. Soc. Lond.*); Notes on the British Dragonflies of the Dale Collection (1908-9, *Ent. Mo. Mag.*); Neuroptera (Linnaean Sense) (1909, in *A Guide to the Nat. Hist. I. of Wight*); Notes on Earwigs that Breed in Britain (1912, *Proc. S. Lond. Ent. and Nat. Hist. Soc.*); British Orthoptera in the Dale Collection (1911 and 1925, *Ent. Mo. Mag.*); Labium (Second Maxillae) of the Paraneuroptera (1922, *Proc. S. Lond. Ent. and Nat. Hist. Soc.*); Caudal Lamellae of the Naiads of the British Zygopterid Dragonflies (1924-25, *Proc. S. Lond. Ent. and Nat. Hist. Soc.*); chapters on the Orthoptera, Paraneuroptera, Neuroptera, etc. (1925 and 1928, in *The Natural History of Wicken Fen*, Parts II and IV); Insect Orders (1925-26, *Proc. S. Lond. Ent. and Nat. Hist. Soc.*); papers on Orthoptera, Psocoptera, Ephemeroptera, Paraneuroptera, Neuroptera and Trichoptera (1926, *The Natural History of the Oxford District*); Notes on the British Snakeflies (1927-28, *Proc. S. Lond. Ent. and Nat. Hist. Soc.*). Many contributions from his pen appeared in the *Surrey Comet*, the *Scottish Naturalist*, *Science Gossip*, the *Proceedings of the Hampshire Field Club*, the publications of the Lancashire and Cheshire Entomological Society and elsewhere. His papers to the *Entomologist* have very largely taken the form of annual reports on the distribution of the Odonata, Orthoptera, Neuroptera and Mecoptera; these reports are compilations of observations sent to Mr. Lucas from various parts of the country, and the complete series forms a very valuable contribution to our knowledge of the distribution of these orders in the British Isles. He was a very skilful artist and an expert photographer, and his figures and plates have added considerably to the value of his published work.

Few men have done more to encourage others to a study of entomology, to direct their attention to the lesser-known orders, and to provide facilities for such study. Beneath his rather nervous and reserved exterior was a kindly and lovable personality, ever ready to help anyone with kindred interests. A certain seeming shyness in the presence of adults vanished before the younger generation, revealing then the fine spirit which animated all his actions. He is a great loss.

I am much indebted to Miss D. E. Lucas, of Ringwood, for the loan of the photograph used to illustrate this notice.

FREDK. J. KILLINGTON.

CUPIDO ARGIADES AND STERRHA SACRARIA IN SUSSEX.—While collecting in Sussex on September 1st last, my friend Baron Bouck had the fortune to capture a female specimen of *C. argiades* resting on a flower-head of scabious. At the time he was netting *icarus* to examine for varieties, and owing to the worn condition of the *argiades* considered it to be nothing more than a curious var. of *icarus* (it having lost the tail on one side and the remaining one being much worn), and only by mere chance kept it to show me, thinking I might like to see the type of variation. When I saw it shortly afterwards I was surprised to find it was *argiades*. By its poor condition it had evidently been on the wing several days. Undoubtedly this species must be regarded as a casual migrant to this country, but may at times be overlooked, as it might readily be mistaken for a dull-coloured blue form of *icarus* when on the wing. It is now forty-six years since *argiades* was taken in Britain, when, in 1885, the Rev. O. Pickard-Cambridge recorded the capture of two specimens by his sons at Bloxworth, Dorset, and another taken the same year at Bournemouth. Baron Bouck also captured a rather worn female *S. sacraria* at Goodwood on August 7th last, which deposited several ova, but these, unfortunately, proved infertile.—F. W. FROHAWK.

SESLIA ANDRENAEFORMIS EMERGING FROM UNCAPPED BORINGS.—On May 2nd, 1931, I searched for capped borings of *Seslia andrenaeformis* between Bere Regis and Blandford, but failed to find any, though old workings were plentiful. In the end I brought home three shoots with holes in them exactly as described by Mr. James W. Woolhouse (jun.) in the August, 1931, *Entomologist*. They bore no trace of capping, and looked as if they had been caused by a No. 5 shot. I cannot say what made me bring them home, for I had little hope of having anything emerge, and there was nothing to indicate that the borings were those of *andrenaeformis*. In due course a moth emerged. The empty pupa-case was protruding as in the case of capped holes. It is a strange thing that some of the larvae trouble to make their ingenious cappings while others dispense with them. Possibly the explanation is a sexual one.—H. L. ANDREWES; The Warren, Bere Regis, Dorset.

ADDITIONS TO THE LEPIDOPTEROUS FAUNA OF THE
COUNTY OF SUSSEX SINCE THE PUBLICATION OF
THE VICTORIA HISTORY LIST, 1905.

BY ROBERT ADKIN, F.E.S.

So far as I am aware, the only list of the Lepidoptera of Sussex that deals with the whole of the Order is that published in the *Victoria History* of the county in 1905. Jenner's list, published in 1885-6, dealt only with the so-called "Macros," and covered only the eastern division of the county. His records appear to be included in the *Victoria History* list, and it may, therefore, be assumed that it was, at the time of its publication, the most comprehensive list of the Lepidoptera of the county. A quarter of a century has elapsed since that list was compiled; it therefore appears to be a fitting opportunity to gather together a number of records that have appeared since that time. Some species mentioned as "rare" or "very rare" have been found to be really much less so than was supposed; several of such cases are included as "additional records."

The nomenclature used (with few exceptions) and the order in which the species are placed in the *Victoria History* list appear to be those of South's *Entomologist* list (1884); it may, therefore, be convenient to follow the same arrangement.

RHOPALOCERA.

No real addition appears to have been made to the butterflies. It is true that there are records of the capture of *Papilio bianor*, Cr., near Lewes and Brighton (*Ent. Rec.*, 1917, p. 184; *Entom.*, 1921, p. 244); and of *Colias palaeno*, L., on the Downs near Lewes (*Entom.*, 1929, p. 11); but there is little doubt that they were the result of escapes or artificial introduction, as was clearly the case with *Opsiphanes tamarindi*, Fldr., a Central American species, the pupa of which had evidently been imported in a bunch of bananas (*Proc. South Lond. Ent. Soc.*, 1930, p. 32); it is therefore doubtful whether any of these species can be regarded as having occurred under natural conditions. A *Melitaea cinxia*, L., taken on June 12th, 1925, may possibly have been blown over from the Isle of Wight (*Entom.*, 1925, p. 170); and a *Cupido argiades* taken in Sussex on September 1st, 1930 (*Entom.*, p. 27, 1932) seems equally adventitious. There are additional records of the capture of *Anosia plexippus*, L. (*archippus*, Fab.) (*Entom.*, 1923, p. 258. and 1925, p. 97).

The status of some few species has, however, altered so materially during the period under notice as to be worthy of mention. Thus, *Melitaea athalia*, Rott., after becoming more and more scarce, apparently quite disappeared from its old haunts for some ten or

twelve years, but in 1929 some half-dozen specimens were taken in Abbot's Wood and several others seen there. *Vanessa polychloros*, L., said in 1902 to be "greatly increasing in numbers," has been exceedingly rare if not completely absent from the county for several years past, but quite recently reports have been received of some two or three specimens seen: there is, therefore, some hope that the species may re-establish itself. *Vanessa c-album*, L., is mentioned only in a footnote "as having occasionally been found." Since the eastward spread of this species, which commenced in or about 1915, there are many records of its occurrence in many parts of the county. In 1929 it is said to have been found near Chichester "in some abundance," and that it appeared to be breeding there (*Entom.*, 1930, p. 115). In 1930 it was not uncommon at Pulborough, and larvae were found feeding on nettle (A. J. Wightman). Since July, 1929, both summer and autumn broods, as well as hibernated specimens, have occurred near a shrubbery at Aldwick Manor, Bognor, where the species appears to have established itself. In 1931 it was more common than *Aglaia urticae* (W. H. B. Fletcher). Larvae were also found in some numbers in 1931 at Barnham (N. C. E. Pilleau). *Limenitis sibylla*, L., has greatly increased in numbers, and there is, at the present time, hardly a wood in the county where it may not be found—in some of them, as, for instance, Abbot's Wood, abundantly. *Apatura iris*, L., still occurs in some of the larger woods in the west of the county, but it has not been seen in its old haunts in East Sussex for many years*; and the same remarks apply to *Satyrus egeria*, L.

Sphinges : HETEROCERA.

Sphinx (Hyloicus) pinastri, L.—A female, in perfect condition, was taken by Mr. E. P. Sharp on June 15th, 1919, near Polegate. It was resting on a telegraph pole near some pine trees (R. A.). One taken at rest on a pine trunk near West Burton (West Sussex) by Mr. Herbert in or about 1917 (A. J. Wightman).

Deilephila lineata, Fab. (*Phryxus livornica*, Esp.).—There are further records: St. Leonards (*Ent. Mo. Mag.*, 1904, p. 277); Petworth (*Entom.*, 1911, p. 274); Littlehampton (*Entom.*, 1931, p. 163); Pulborough (*ibid.*, p. 232).

Chaerocampa neri, L.—Additional records: Eastbourne, July 14th, 1904—one at rest on a bathing-machine; August 15th, 1910—one floating on the sea off the pier head; September 13th, 1919—one resting on a bush on the Wish Tower slopes (*Moths of Eastbourne*, Part 1, p. 12). Brighton (*Entom.*, 1931, p. 13).

* Since this has been in print Mr. J. R. le B. Tomlin has told me that he saw an *A. iris* between Polegate and Hailsham on July 21st, 1931.—(R. A.).

Sesia (Aegeria) flaviventris, Staud.—Laughton and Pulborough, not rare (A. J. Wightman).

Bombyces :

Nola albula, Hb. (*albulalis*).—Additional records : Near Seaford (A. J. Wightman). The late Thomas Salvage used to take this species in some numbers near Arlington (R. A.).

Ocneria dispar, L.—Eastbourne, at rest on the stem of a tree (*Entom.*, 1909, p. 321).

Bombyx (Malacosoma) castrensis, L.—Near Eastbourne (*Entom.*, 1926, p. 205).

Cynatophora octogesima, Hb.—Additional records : Sparingly at sugar, also as larvae, near Pulborough (A. J. Wightman). A specimen is also recorded as having been taken in Abbot's Wood by Mr. S. A. Chartres (R. A.); and two others at Buxted by G. W. Wynn (*Entom.*, lxx, p. 37).

Noctuae :

Bryophila algae, Fb.—A specimen in the late J. W. Tutt's collection was labelled "Hastings, 1873" (R. A.).

Arsilonche (Simyra) albovenosa, Göze.—Mr. A. L. Rayward took an apparently freshly-emerged male at rest on a gate-post on the border of the marsh at Eastbourne on August 13th, 1928 (R. A.).

Leucania l-album, L.—A female was taken at ivy blossom at Eastbourne on October 14th, 1909 (*Entom.*, 1909, p. 322.)

L. obsoleta, Hb.—Near Eastbourne (*Entom.*, 1924, p. 284); larvae and pupae in some numbers in a reed-bed some twenty miles from the above (*Entom.*, 1926, p. 209); West Sussex (A. J. Wightman).

L. littoralis, Curt.—Common locally in West Sussex (A. J. Wightman).

L. unipuncta, Hw. (*extranea*, Guen.).—Additional record : A very perfect specimen was taken at sugar in a garden at Ringmer on October 25th, 1928 (J. E. Eastwood).

L. impudens, Hb.—Additional records : Very common all round Pulborough (A. J. Wightman).

L. favicolor, Barr.—East Sussex (*Entom.*, 1909, p. 323).

L. straminea, Tr.—Additional records : Quite common in suitable places near Eastbourne (E. P. Sharp) and Pulborough (A. J. Wightman).

Coenobia rufa, Hw.—Additional record : Very common all round Pulborough (A. J. Wightman). The late Thomas Salvage used to take this species in considerable numbers near Arlington (R. A.).

Calamia phragmitidis, Hb.—Near Rye (*Entom.*, 1908, p. 231); quite plentiful in the valley of the Cuckmere and Pevensey marshes (*idem*); West Sussex (A. J. Wightman).

Senta maritima, Tausch.—Near Rye (*Entom.*, 1908, p. 231); in the valley of the Cuckmere (*ibid.*, p. 204); near Lewes and Pulborough (A. J. Wightman); not uncommon locally in old reed-beds.

Nonagria sparganii, Esp.—Near Seaford (*Entom.*, 1911, p. 300); abundant locally in both East and West Sussex (*Entom.*, 1931, p. 114).

N. neurica, Hb. (*edelsteni*, Tutt).—First taken by Messrs. E. P. Sharp and A. J. Wightman in the "Cuckmere Valley" in 1908 (*Ent. Mo. Mag.*, 1911, p. 203, pls. iii and iiii); local, but fairly common, in the places where it occurs.

N. dissoluta, Treits.—Occurs sparingly locally in the western part of the county; would probably be more common if the reeds were not so persistently cut in the few spots where it has been taken (A. J. Wightman).

Laphygma exigua, Hb.—Additional records: Eastbourne; several specimens were taken at the blossoms of reeds in the marshes and at street lamps on the outskirts of the town in 1906 (E. P. Sharp); Lindfield (*Entom.*, 1927, p. 44).

Agrotis lunigera, St. and *A. lucerneae*, L.—Near Seaford (*Entom.*, 1908, p. 41). On the Downs near Beachy Head at sugared knapweed heads (E. P. Sharp).

Cerastis erythrocephala, Fb.—Additional records: Near Eastbourne (*Entom.*, 1922, p. 20). Two or three other specimens were taken in Abbot's Wood district at about this period by the late Thomas Salvage (R. A.).

Dianthoecia compta, Fb.—A specimen was bred by the late Thomas Salvage in June, 1921, from *Silene* seed-heads collected near Lewes in the previous summer. It is now in my collection (R. A.).

Epunda lichenea, Hb.—Additional record: Eastbourne; several specimens at light, September and October, 1931 (R. A.).

Xylina lambda, Fb. (*zinckenii*, Tr.).—I have a specimen which came from the late A. B. Farn's collection, labelled "Lewes, 1873" (R. A.).

Plusia ni, Hb.—Near Cuckfield (*Entom.*, 1928, p. 253).

Calophasia platyptera, Esp.—A specimen near Brighton, September, 1896 (*Entom.*, 1896, p. 319).

Heliothis peltigera, Schiff.—Additional records: Dungeness, Eastbourne, etc., larvae very abundant (*Entom.*, 1928, p. 258).

Hydrelia uncula, Clerck.—Not rare in several West Sussex marshes (A. J. Wightman).

Hermينيا cribralis, Hb. (*cribrumalis*, Hb.).—Additional record: Not rare near Pulborough (A. J. Wightman).

Geometrae :

Epione parallelaria, Schiff.—Additional record : Storrington, a specimen on September 29th, 1930 (*Ent. Rec.*, 1931, p. 16).

Amphidasys betularia, L.—The melanic form, ab. *carbonaria*, Jordan (*doubledayaria*, Mill.), has been taken frequently during the past few years and appears to be becoming increasingly common in the county (R. A.).

Nemoria viridata, L.—Chailey (*Entom.*, 1920, p. 211).

• *Anaitis efformata*, Guen.—Burgess Hill (*Entom.*, 1931, p. 13) ; not uncommon in Abbot's Wood (R. A.).

Pyalides :

Psamotis pulveralis, Hb.—Bognor, at a street lamp (*Ent. Mo. Mag.*, 1907, p. 110).

Margarodes unionalis, Hb.—Additional records : Arlington (*Entom.*, 1921, p. 76) ; Polegate (*Entom.*, 1925, p. 16) ; Lewes (*Entom.*, 1931, p. 85).

Pterophori :

Pterophorus carphodactylus, Hb.—A specimen was taken at rest on a paling at Holywell, Eastbourne, on June 16th, 1924 (R. A.).

Crambi :

Myelois neophanes, Durrant.—A specimen was taken near Newhaven on July 7th, 1923, and verified by Mr. Durrant (J. E. Eastwood).

M. cribrella, Hb.—Two specimens were taken by Mr. A. L. Rayward on waste ground near the Downs, Eastbourne, in July, 1929 (*Entom.*, 1930, p. 17), others on the Crumbles (*ibid.*, p. 114).

Salebria semirubella, Scop.—A specimen was taken by Mr. A. L. Rayward on the Crumbles, Eastbourne, on July 12th, 1929 (*Entom.*, 1929, p. 17).

Ephestia semirufa, Staint.—A single specimen at East Grinstead in 1906 (*Ent. Mo. Mag.*, 1907, p. 83).

Phycis ornatella, Schiff.—Milton Hide, Hailsham (*Ent. Rec.*, 1910, p. 251).

Tortrices :

Tortrix pronubana, Hb.—First recorded as British from a specimen taken at Eastbourne (*Proc. Ent. Soc.*, 1905, p. lxiii) : a second specimen was taken at Bognor (*Ent. Mo. Mag.*, 1905, p. 276). The larva was first found at Eastbourne in the following year (*Entom.*, 1906, p. 265). The species has since spread over the greater part of the county, and in some places has become a pest in greenhouses, etc.

Peronea comariana, Zell.—Eastbourne (*Entom.*, 1930, p. 114).

Sciaphila communana, H.-S.—East Grinstead (*Ent. Mo. Mag.*, 1907, p. 83).

Evetria purdeyi, Durrant.—A specimen came to light in my house at Eastbourne, August 28th, 1930 (R. A.).

Carpocapsa grossana, Hb.—Additional record: Eastbourne, at rest on a paling, June 28th, 1924 (R. A.).

Choreutes bjerkanarella, Thurb.—Additional record: Southwick (*Entom.*, 1931, p. 13).

Lozopera beatriceella, Wals.—Near Seaford (*Entom.*, 1928, p. 17).

Laspeyresia conicolana, Heyl.—Broadwater Forest (*Entom.*, lxx, p. 37).

Tineæ :

Hyponomeuta malinellus, Zell.—This species (or biological race) is common on crab in woods near East Hoathly, and even more so on cultivated apple in gardens at Eastbourne (*Proc. South. Lond. Ent. Soc.*, 1928, p. 51, pls. v-vii).

H. rorellus, Hb.—Near Brighton (*Ent. Mo. Mag.*, 1908, p. 250).

Cerostoma vittella, L.—Fairly common in my garden at Eastbourne (R. A.); abundant at Lewes (*Staint. Man.*, ii, p. 313).

Orthotelia sparganella, Thurb.—Occurs sparingly in the marshes near Eastbourne (R. A.).

Lita suaedella, Richardson.—A moth came to light in my house at Eastbourne in August, 1930 (R. A.).

L. atriplicella, F. & R.—Common near Eastbourne (*Entom.*, 1931, p. 19). I have also specimens taken at Lancing by A. C. Vine in 1909 (R. A.).

Mesophleps silacellus, Hb.—Taken sparingly on the Downs near Brighton, June and July, 1905, by A. C. Vine (*Ent. Mo. Mag.*, 1906, p. 28).

Blastobasis lignea, Walsm.—Taken commonly in a garden at Eastbourne, July and August, 1930 (*Entom.*, 1930, p. 285); again in 1931 (R. A.).

Argyresthia illuminatella, Zell.—Beaten from *Pinus* near Hailsham, June, 1905 (*Ent. Mo. Mag.*, 1905, pp. 226, 265).

Coleophora tricolor, Walsm.—Near Seaford (*Entom.*, 1907, p. 36).

C. saturatella, Staint.—Ditchling Common (*Ent. Rec.*, 1919, p. 203). (*C. bilineatella*, Zell., mentioned in the list, is probably intended to refer to this species.)

C. agrammella, Wood.—Taken in a damp lane near Hailsham, May, 1912 (*Ent. Mo. Mag.*, 1913, p. 89).

Bucculatrix boyerella, Dup.—Additional record: Fairly frequent on elm trees growing in the roads in the Meads district of Eastbourne (R. A.).

“Hodeslea,” Eastbourne;
December, 1931.

CONCERNING *HETEROPTERUS (CYCLOPIDES)*
MORPHEUS, PALL.

By J. A. SIMES, O.B.E., F.E.S.

IN the course of a short holiday in June, 1931, in the Dept. of Charente, S.W. France, I was fortunate enough to find this interesting skipper butterfly in abundance in the forest belt to the east and south-east of Angoulême ; and as it is an insect which is not often observed under such favourable conditions, a few notes on my observations may be of interest. The first example was observed on June 9th ; two days later three more examples were secured : but on June 15th, 16th and 17th, in a different part of the forest, it was flying in great abundance throughout the morning and afternoon. It flies only in the sunshine, and disappears immediately the sun is obscured ; but given the necessary sunshine one is bound to see it flying if it is in the neighbourhood. Kane's *Handbook* gives one the idea that it is best hunted in dull weather at the end of June, when it is to be kicked out of the herbage. I should think this is quite wrong. The end of June would be distinctly late for the insect, and I should imagine that the chances of kicking it out of damp herbage would be small indeed. For *H. morpheus* is a sun-loving butterfly if ever there was one ; and its natural unhurried flight down a sunlit glade is a thing which I never tired of watching, and which I shall certainly never forget. It is entirely unlike the flight of any other butterfly that I have ever seen, and makes one think of fairy dancing rather than of insect flight. For *morpheus* literally dances its way along just over the tops of the high grasses, never hurrying, rarely alighting. The insect dances into your ken as it enters the glade thirty or forty yards from where you are standing ; it dances leisurely along to where you stand, and it is still dancing in the same rhythmical way, up and down, from a few inches to a foot or two above the grass-tops as it recedes from you down the glade and disappears into the scrub. So regular and so uniform is the flight that one can instantly identify the insect at a considerable distance by that alone. This, as I have said, represents the natural, unhurried flight. When disturbed or alarmed the insect has quite another gait, and flies in the wild, dodging fashion common amongst skipper butterflies. At such times it is apt to resort to the disconcerting tactics of flying-in on one so rapidly that the net cannot be used effectively and it thus escapes.

On the rare occasions when I have seen it alight, the blossoms affected were generally those of the rock rose (*Helianthemum*) ; but I have also seen it on the flowers of *Erica*, Scabious and White

Clover. On several occasions when I was boxing one out of my black net another example alighted either on the net or on my clothes: but whether the attraction was the dark colour—so like its own—or whether it was perspiration I am unable to say.

In dull weather and at night *morpheus* roosts in the coarse grasses and sedges. The resting-site was generally on a blade of grass or sedge, in a horizontal position, and near the central stem, the wings being closed over the back in the usual butterfly manner. In such a position it was impossible to doubt that the curious coloration and markings of the underside of the hind wings and apex of fore wings had been definitely developed to suggest the inflorescence of the sedges amongst which the butterfly rests. *H. morpheus* therefore provides us with as perfect an example of special protective coloration for resting purposes as does *Euchloë cardamines*, which, as is well known, is designed for resting amongst the flowering heads of the Umbelliferae.

LIMENITIS SIBYLLA AND EULYPE HASTATA IN READING DISTRICT.—Between about 1888 and 1897 my favourite collecting ground was the country about Wellington College and Finchampstead, chiefly near Longmoor Pond. There were half a dozen of us enthusiastically working the district, and I can safely assert that neither *Limenitis sibylla* nor *Eulype hastata* was ever seen there by any one of us. The former occurred at Mortimer, the only spot I knew for it within a ten-mile radius of Reading. For *hastata* one went to Pamber Forest: it was regarded as a very good thing. I wrote to Mr. A. H. Hamm recently to find out if he knew of other localities about Reading for these two insects in those days, as he collected in that neighbourhood with great fervour. He adds Pamber and Aldermaston for *sibylla*, and says that a few years ago Mr. Claude Rippon had seen it between Wokingham and Wellington College. *Hastata* Mr. Hamm, too, only knew from Pamber. Now to come to the point. I heard a short time ago from Mr. H. S. Morris, one of those who collected in those remote days and who is now living near Longmoor Pond. He says that this year (1931) *sibylla* has been abundant and *hastata* in swarms there. This is a very interesting instance of the occupation of new areas. I have an idea that *hastata* must be much more plentiful and widespread than it was formerly, though I can give no definite reason for the belief. Perhaps black and white coloration is in the ascendant just now.—H. L. ANDREWES; The Warren, Bere Regis, Dorset, December 4th, 1931.

HELIOTHIS PELTIGERA IN N. CORNWALL.—Three larvae of *Heliothis peltigera* were found near Newquay on July 27th, 1931. They were feeding on Henbane, one being almost full fed, and the other two about half-fed, but, unfortunately, only the large one reached the pupal stage and that has since died.—P. SIVITER SMITH; Pebworth, Stratford-on-Avon, December 7th, 1931.

A NEW NAME AND DIAGNOSIS FOR A GENUS OF *PIERIDAE*.

BY G. TALBOT. F.E.S.

Dixeia (nom. nov. pro *Pinacopteryx* auct. nec Wlgr.).

Pinacopteryx Wlgr. (part.), Rhop. Cafr., p. 7, 1857.

Auriv., Rhop. Aethiop., p. 400 (1898) (*Pieris*, part.); Seitz' Macrolep., viii p. 45 (1910) (*Pieris* : *pigea* group).

Dixey, Proc. Ent. Soc. Lond., 1909, p. cix; *idem*, 1912, pp. cxi-cxii; Trans. Ent. Soc. Lond., 1918, pp. 191-208 (1918) (Rev. of *charina* group of *Pinacopteryx*).

THIS genus is allied to *Belenois* Butl., and is confined to the African faunistic region. Species of small size, usually smaller than *Belenois*.

Wing characters.—Fore wing with vein 6 farther from the end of the cell, and the second subcostal nearer end of cell than in *Belenois*; first subcostal ending on the costa at a point not beyond the fork of vein 6. In cellule 3 a dot or rounded spot usually present, rarely absent in the female. Rarely a dot present on the discocellular veins. When present the dark marginal border is very narrow, usually only pronounced near the apex.

Upperside coloration greenish-white or yellow in the male. The female variable, chalk-white to grey, yellow, or orange. Underside with usually few markings, hind wing sometimes mottled. Fore wing with discal spot and marginal dots. Hind wing with marginal and post-discal dots or with either or both absent.

Scent-scale.—"Differs from *Belenois* in the expanded, usually rounded bases of the lamina. In one section (*simana*, *charina*, *liliana*) the basal expansion is abrupt and the sides of the lamina distal to it are parallel" (Dixey, 1909).

Genitalia.—"In all the species of the *pigea* group the clasper ends posteriorly in two spinous prolongations, one placed dorsally to the other (fig. 1). In the *charina* group the clasper is furnished posteriorly with only one spine instead of two (fig. 2).

"There is also a difference to be observed between the two sections of *Pinacopteryx*, in reference to the character of the uncus. This structure in the *charina* group is comparatively slender, and rather sharply pointed. The dorsal margin is slightly sinuous in outline, and the distal portion of the uncus is curved downwards, sometimes so decidedly as to give the organ almost a sickle-shaped character (fig. 7). In the *pigea* group, on the other hand, the dorso-ventral dimension is proportionately greater, the free extremity is comparatively blunt, the dorsal margin is uniformly convex, and the curve of the organ, though present, is less pronounced (fig. 6)" (Dixey, 1918).

Genotype.—*Pieris charina* Bois.

The genus contains the following species, most of them having races and seasonal forms. The number of actual species will perhaps be reduced by further research. *Astarte* Butl. (? race of *capricornus*). *capricornus* Ward, *cebron* Ward, *charina* Boisd. (with 5 subspecies). *diweyi* Neave. *doxo* Godt. (? = *charina*), *helena* Sm., *narena* Sm., *orbona* Geyer, *pigeu* Boisd., *rubrobasalis* Lanz, *spilleri* Spill.

The species *doxo* Godt. has never been identified with certainty. It is very close to *charina voltaensis* Talb. There seems no doubt that *doxo* belongs to the *charina* group of the genus; its probable locality is Senegal. The name can stand as representing the north-western race of *doxo* (replacing *charina* Bdv.).

LASPEYRESIA CONICOLANA HEYLAERTS IN SUSSEX.—When looking at my friend Mr. L. T. Ford's collection a few days ago I was pleased to find a couple of worn specimens of this moth among a few *Laspeyresias* netted flying round Scotch firs at Broadwater Forest, Sussex, on June 26th, 1931. This occurrence, so widely separated from the others at Blean in Kent and the New Forest, Hants, shows that the moth is probably well distributed in our southern counties, as I forecast in my original paper in the *Entomologist* of February, 1931. When netting the insect at one locality in the New Forest last June I noticed a number of cones under some Scotch fir-trees with holes in them; when I broke up one or two I found these were caused by burrows similar to those made by *L. strobilella* Linn. in spruce cones. I had little doubt at the time that they were old burrows of *conicolana*, but the point has been settled by my friend Mr. W. Fassnidge, who has recently sent me on account of the life-history of the insect by MM. Nègre and Picard from the *Bulletin de la Société Entomologique de France* for January, 1921. The history of the moth appears to be exactly the same as that of *strobilella*, except that it attacks the *sylvestris* group (the French insects were bred from Salzmann's pine, the Dutch and Austrian from the Scotch fir) instead of the spruce. The similarity in life-history, great disparity in size of the sexes when taken in bulk and the curious character of the lustrous markings all bear out the idea that *conicolana* has more affinities with *strobilella* than *cosmophorana*, which it so closely resembles superficially. Mr. Pierce, at the outset, pointed out that the genitalia were quite distinct from those of the *cosmophorana* group, and approached more nearly to *scopuriana* and *strobilella*.—H. C. HUGGINS; 5, Windsor Avenue, Cliftonville, Margate, January 4th, 1932.

PALIMPSESTIS OCTOGESIMA IN SUSSEX.—I captured at sugar in my garden last June two specimens of *Palimpsestis octogesima*. This species is, I believe, scarce in East Sussex.—G. W. WYNN; The Old Cottage, Buxted, Sussex.

A SYNOPSIS OF THE BRITISH HYMENOPTEROUS FAMILY CYNIPIDAE.

By CLAUDE MORLEY, F.E.S., F.Z.S.

(Continued from p. 15).

Genus iii: ALLOXYSTA, Först.

My material is too sparse to allow of an adequate table of our species; but from it I form a somewhat definite opinion that the present "genus" represents nothing but weak forms of species already enumerated under *Allotria*, from which it differs in nothing whatever but the lack of external nervure in the radial cell. The conformation of this cell in the group represented by *Alloxysta trapezoidea*, Htg., may render that group an exception to the above remark, since in it they differ from any true *Allotria*; I have seen not the group. Certainly of the thirteen "species" described by Cameron in 1890—and the total is not raised in *Gen. Ins.* by the addition of Kieffer's exclusively British var. *britannica* (*Bull. Soc. Hist. Nat. Metz*, 1902, p. 11) of the exclusively Swedish *A. citripes* Thoms. (*Ofv.*, 1861, p. 410)—it would seem that the first four, *macrophadna*, Htg., *maculicollis*, *basimacula* and *flicornis*, Cam., are mere forms of *Allotria victrix*; and that both *ullrichi*, Gir., and *piceomaculata*, Cam., are mere forms of *Allotria minuta*; these alone I know in Suffolk. *Alloxysta macrophadna* was swept from low herbage on August 8th, 1913, at Brandon Staunch. *A. flicornis* was swept from *Vicia sativa*, along with *Allotria victrix*, at Brandon on May 5th, 1907; from reeds at Chippenham Fen in Cambs on September 25th, 1907; and in lanes at Wangford near Southwold on September 4th, 1911, where also occurred *Alloxysta basimacula* on September 13th, 1912—all three known as indigenous only from Scotland in 1890. *A. ullrichi* was bred from an unnamed host on August 9th at Blackheath by Alfred Beaumont; it has occurred to me on June 5th, 1916, in Tuddenham Fen, and in a sand-pit on September 25th, 1928, at Reydon. *A. piceomaculata* was swept at Brandon Staunch on June 11th, 1908; one emerged on June 29th, 1909, at Monks Soham from the indurated skins of Aphides, *Siphonophora sonchi*, whence on the 14th had emerged ♀♀ of both the Braconids, *Aphidius rosae* and *Praon volucre*; and another emerged during 1908, that shows the apices alone of notauli distinctly impressed (? genus *Hemichrysis*, Först.) from *Siphonophora urticae*, Kalt., in my garden here.

Sub-family FIGITINAE.

TABLE OF TRIBES.

- | | |
|---|---------------------|
| (2) 1. Abdomen petiolate, second segment longer than third; scutellum basally bifoveate . | <i>Anacharides.</i> |
| (1) 2. Abdomen sessile, with the second segment shorter than third. | |
| (4) 3. Scutellum sulcate; second segment very short, apically produced | <i>Onychides.</i> |
| (3) 4. Scutellum not sulcate: second segment normally short, and not produced | <i>Figitides.</i> |

Tribe ANACHARIDES.

TABLE OF GENERA.

- | | |
|---|-----------------------|
| (2) 1. Petiole simple, extending fully to hind coxal apex; metanotum exareolate | i. <i>Anacharis.</i> |
| (1) 2. Petiole striate, not extending to coxal apex; metanotum areolate. | |
| (4) 3. Scutellum disco-apically pyramidal | ii. <i>Xyalaspis.</i> |
| (3) 4. Scutellum apically conical, not produced | iii. <i>Aegilips.</i> |

Genus i: ANACHARIS, Dalm.

Table of Species.

- | | |
|---|------------------------|
| (4) 1. Petiole at least half length of abdomen, and reaching beyond hind coxae. | |
| (3) 2. Larger, wings hyaline: hind femora mainly red, their metatarsi dark | 1. <i>tineta.</i> |
| (2) 3. Smaller, wings darker; hind femora mainly black, their ♂ metatarsi red | 2. <i>typica.</i> |
| (1) 4. Petiole shorter, and not reaching beyond hind coxae. | |
| (8) 5. Scutellum glabrous, except at apical margin. | |
| (7) 6. Abdomen ovoid; petiole as long as second segment; legs pale | 3. <i>eucharoides.</i> |
| (6) 7. Abdomen compressed; petiole shorter; legs partly dark | 4. <i>ensifera.</i> |
| (5) 8. Scutellum rugose; petiole shorter than half abdomen | 5. <i>immunis.</i> |

The filiform petiole of the first two species strongly resembles that of ♂ Fossors, *e. g.* *Ammophila sabulosa*, Linn., and those of the rest are like that of the Proctotrupid, *Helorus anomalipes*, Panz., though without sculpture, wherein this genus differs from *Aegilips*;

the *verba ultima* of exaggerated petiolation is found in the curious Neotropical Trigonalid, *Pelecinus polyturator*, Drury, for there the petiole itself is longer than head and thorax and yet the broadest of all abdominal segments! I hold no brief for the specific stability of the above five insects, though universally recognized since erected in Walker's 1835 *Descriptions of Some British Species of Anacharis* (*Ent. Mag.*, ii, p. 518), to which no additions have been made during the century. None of them is rare, though records are sparse owing to our lack of observers among the smaller Hymenoptera: *A. tincta*, Walk., has been found in Middlesex, Hants, Montgomery, in July and September (*loc. cit.*); and Notts (Carr, *Invert. Faun. Notts*, 1916); at Ringstead Downs in Norfolk (Morley, *Trans. Norf. Nat. Soc.*, 1913, p. 603). Tuddenham Fen, and sitting quiescently below an elm leaf in my orchard here, in both June and August. *A. typica*, Walk., is distinctly a more fragile and slender insect, with sufficiently obviously darker wings, said to be "common" (Cameron) in Middlesex and Hants during June to August (Walker), though I can assign to it but a single pair in my collection that I swept at Louisburgh in co. Mayo and on Clare Island there in the middle of July, 1910 (*tincta*, sic, *Proc. R. Irish Acad.*, 1911, xxiv, p. 18). *A. eucharoides*, Dalm., was from Middlesex, Berks, Hants and Jersey in June and September (Walker); common in Dorset (Glanville's Wootton); I have beaten it from oak trees at Brandon in Suffolk during May, June and August, when it occurred along with both *A. immunis* and *A. ensifera*; and from birch at Mildenhall there in June, with *A. ensifera*. *A. ensifera*, Walk., was from Middlesex, Berks. in June (Walker), Surrey (Beaumont), Herts (Piffard), and thought widely distributed by Cameron; in June I have swept it at Brandon Staunch along with *A. eucharoides*, of which latter species I possess two specimens bred respectively on May 15th, 1908, from the Lepidopteron *Scoparia mercuriella*, Linn., at Drimnin in Scotland by Mr. W. Renton, and on November 22nd, 1921, from the pupa of an unnamed Coleopteron, whereon its egg was discovered three weeks earlier at Bristol by Mr. H. W. Miles. Hitherto I believe the genus's known parasitism to have been confined to Handlirsch's rearing of both *A. typica* and *A. ensifera* (*Verh. Ges. Wien*, xxxvi, p. 235) from the common British Neuropteron, *Hemerobius nerrosus*, Fab., on the Continent. Our most uncommon form is certainly *A. immunis*, Walk., which ("*A. eucera*," Dale) is very rare in Dorset, found only in Middlesex during July (Walker), Worcester and Lanark (Cameron); besides the above Brandon record, when three "species" were found in company on August 7th, 1913, at the *Diastictus*-place, I have seen one specimen in June in my Monks Soham garden.

(To be continued.)

LIST OF THE BRITISH PLECOPTERA.

BY THE LATE W. J. LUCAS, B.A.

PERLODES.

- 1.
- Perlodes mortoni*
- , Klapálek.

DICTYOPTERYGELLA.

- 2.
- Dictyopterygella recta*
- , Kempny.

ISOGENUS.

- 3.
- Isogenus nubecula*
- Newman.

PERLA.

4. *Perla carlukiana*, Klapálek.
 5. *Perla marginata*, Panzer.
 6. *Perla cephalotes*, Curtis.

ISOPERLA.

7. *Isoperla grammatica*, Poda.
 8. *Isoperla griseipennis*, Pictet.

CHLOROPERLA.

9. *Chloroperla torrentium*, Pictet.
 10. *Chloroperla tripunctata*, Scopoli.

CAPNIA.

11. *Capnia nigra*, Pictet.
 12. *Capnia atra*, Morton.
 13. *Capnia vidua*, Klapálek.

TAENIOPTERYX.

14. *Taeniopteryx putata*, Newman.
 15. *Taeniopteryx risi*, Morton.

RHABDIOPTERYX.

- 16.
- Rhabdiopteryx neglecta*
- , Albarda.

NEPHELOPTERYX.

- 17.
- Nephelopteryx nebulosa*
- ,
-
- Linnæus.

LEUCTRA.

18. *Leuctra geniculata*, Stephens.
 19. *Leuctra moselyi*, Morton.
 20. *Leuctra klapálaki*, Kempny.
 21. *Leuctra hippopus*, Kempny.
 22. *Leuctra inermis*, Kempny.
 23. *Leuctra nigra*, Pictet.

PROTONEMURA.

24. *Protonemura præcox*, Morton.
 25. *Protonemura meyeri*, Pictet.

AMPHINEMURA.

26. *Amphinemura cinerea*, Olivier.
 27. *Amphinemura standfussi*, Ris.

NEMOURA.

28. *Nemoura variegata*, Olivier.
 29. *Nemoura dubitans*, Morton.
 30. *Nemoura marginata*, Pictet.
 31. *Nemoura cambrica*, Stephens.
 32. *Nemoura avicularis*, Morton.

NEMURELLA.

- 33.
- Nemurella inconspicua*
- , Pictet.

NOTES.

- (1) *Perlodes* supersedes *Dictyopteryx* which is preoccupied.
 (2) *Isogenus nubecula*, Newman. The species was described in *Entom. Mag.*, i, p. 415 (1833).
 (3) *Perlodes mortoni* = *Dictyopteryx microcephala* of British lists. *Perla carlukiana* = *Perla maxima* of British lists. Klapálek's nomenclature is followed for these two British forms.
 (4) *Perla marginata*. McLachlan seemed to have no doubt about its occurrence, perhaps in the Lake District.
 (5) *Isoperla*, Banks, replaces *Chloroperla*, auct. (nec. Newman). *Chloroperla*, Newman, correctly applied, replaces *Isoteryx*, Pictet, being an older name for that genus. These changes have not been generally adopted yet by European authors.
 (6) *Isoperla griseipennis*. It is desirable to use this name in preference to *C. venosa* (see *Entom.*, xviii, p. 285, 1915).
 (7) A number of the generic names used in the list were originally described as sub-genera, but there seems to be no advantage in this and it is better to treat the sub-generic groups as genera.
 (8) This list has been compiled with the very kind assistance of Mr. K. J. Morton, of Edinburgh.

Kingston-on-Thames;
 December, 1931.

NOTES AND OBSERVATIONS.

FLYING HABITS OF MELITAEA AURINIA.—With regard to the recent notes on this species from the Rev. Geo. Wheeler and Mr. Campbell Taylor, my own observations do not agree with those made by these gentlemen. Each year since 1920 during residence at Andover, Basingstoke, and here, I have bred *M. aurinia* in very large numbers in an endeavour to establish the species in suitable localities. These endeavours, I may say, have, so far as I have been able to observe, been unsuccessful. I have put them down in three stages—ova, larvae and imagines. In the latter stage I have invariably found that the majority of the insects will not remain in the spot where I placed them, and I have found them flying at odd places a considerable distance away. In one case, when I put down no fewer than some 1500, a few days after I could not find one. In other instances when I placed a considerable number, a small proportion remained and produced larvae, which in the following spring produced imagines. These presumably wandered away, as no larvae were found in the autumn or spring following. In every instance I have found imagines in scattered situations far removed from the original spot. I have also found straying insects at a distance from wild colonies that I discovered.

Melitaea cinxia seems to have very similar habits and flight. Two seasons ago I put down here in a suitable field a very large quantity of imagines; these freely deposited, and many wandered long distances, some being observed as far as ten miles away. In the following June a fair number of imagines were noted on the wing, but I have not yet been able to find any resulting nests of larvae this autumn. In recent years this species has spread considerably in the Isle of Wight, principally, I think, by wandering imagines, although I believe a number of insects have been purposely put down. I have noted year after year that many of the *M. cinxia* released in my garden (a large area of rough heather, etc.) will remain and pair, and deposit on growing plantain; others will wander away long distances, and deposit on odd plants of plantain in gardens, etc. On the other hand *M. aurinia*, when released under similar conditions, will not remain long enough to pair and deposit on the scabious in the garden, and they all disappear and are not further traced. I think it is a mistake to assume that the flight of *M. aurinia* is weak; on warm sunny days I have found them very active on the wing and quite capable of sustained flight, and I have often seen them flying rapidly over heather and downland. From my own experience I consider that *M. aurinia* is much given to wandering long distances, and I believe this to be the principal reason why I have not been able to establish permanent colonies, as I have no evidence that parasites have been to blame. In certain cases wild colonies that I found have become extinct; parasites may be the cause of this, as I have some evidence, but wandering may also be responsible. In a locality near here last March I liberated large numbers of larvae; in

the following June numbers of imagines were seen, and in September last a large number of nests of larvae were observed. As this locality is an extremely suitable one and unlikely to be disturbed, I have hopes of at last being able permanently to establish a colony of *M. aurinia*. I have been informed of other unsuccessful attempts to establish the species and of other species as well, and have also myself had similar unsatisfactory experiences with other species.—S. G. CASTLE RUSSELL; Fleet, Hants.

THE NAME *COLIAS* AUCT.—In the *Entomologist*, 1931, lxiv, p. 273, (Capt. A. F. Hemming rectifies some omissions I made in my article on certain Pierine genera. I regret that my little effort should be apparently the cause of the introduction of the new name, *Coliastes* Hemm. The fact that *Eurymus* Sw. was preoccupied was first pointed out by Holland (*Ann. Carn. Mus.*, 1930, xix, No. 3, p. 198), and was not known to me in time to make the correction. I had hoped, meanwhile, that the name *Colias* would be put on the list of *nomina conservanda*. If such a list is to be maintained, *Colias* shouts loudly to be among the chosen. Should this course not be adopted, it appears that we shall have to use, not *Coliastes*, but *Scalidoneura* Butl.—a most unwelcome name. *Scalidoneura* Butl. (*Proc. Zool. Soc.*, 1871, p. 250) (type *hermina* Butl.) is based chiefly upon the position of the second subcostal of the fore wing. It was meant to apply to the groups of *euxanthe* and *dimeria*, *hermina* being at most not more than a slight form of *euxanthe*. The second subcostal of the fore wing is quite variable in position in other *Colias*, even among individuals of the same species, as *hyale* and *croceus*. Therefore, the name *Scalidoneura* is synonymous with *Colias* auct. The allied *Zerene* Hbn. (= *Meganostoma* Reak.) appears sufficiently distinct to rank as a good subgenus. If what has been said above can apply, our old friend *Colias edusa* must henceforth be called *Zerene* (*Scalidoneura*) *croceus*! It is to be sincerely hoped that *Colias* Sw. may become a *nomen conservatum*.—G. TALBOT.

PACHYCYNEMA HIPPOCASTANARIA: TIMES OF APPEARANCE.—Referring to Mr. H. L. Andrewes's notes on this subject (*ante*, p. 19), my experience of *P. hippocastanaria* dates back to the time when Shirley Heath, near Croydon, was a profitable hunting-ground, and my note-books of those days give the following details: The moth was most plentiful on the wing from the beginning to about the middle of April, but I once took a worn specimen as late as May 22nd. The larvae from these spring moths were full-fed about the middle of June, and the moths from them emerged during the first half of July. Larvae were again obtainable during September, but unfortunately in those days the winter pupae were kept indoors in a cool attic, and the moths emerged in January and February, instead of April, as they no doubt would have done under normal conditions. Although *hippocastanaria* is notoriously irregular in emergence, odd examples occasionally cropping up at all sorts of times, I think we may take it that under normal conditions the

larvae are full fed in June and September, that the moths emerge in April and July, and that it invariably hibernates as a pupa.—ROBERT ADKIN; "Hodeslea," Eastbourne, January, 1932.

EUPITHECIA TRISIGNARIA.—In Farren's "List of the Lepidoptera of Wicken and the Neighbouring Fens," included in *The Natural History of Wicken Fen*, Part III, *E. trisignaria* does not appear. I have also failed to find any records for the eastern counties. It may therefore be noted that the larvae of this species have been found abundantly the last two seasons on *Angelica sylvestris* in one of the Cambridgeshire fens near the Suffolk border. In the same locality *E. albipunctata* was far less common, but yielded one var. *angelicuta*.—W. S. GILLES; Bocking, Braintree, Essex.

HEMEROBIUS PERELEGANS STEPH. (NEUROPTERA): AN ADDITIONAL LOCALITY.—While recently arranging the general collection of Neuroptera in the Hope Department, University Museum, Oxford, I came across a male of this species. It was captured by the late Col. J. W. Yerbury on May 31st, 1904, at Aviemore, Inversness-shire. I am indebted to Prof. E. B. Poulton, who very kindly allowed me to make a preparation of the genitalia and so place the identification of the specimen beyond doubt. The known distribution of *H. perelegans* is given by Mr. K. J. Morton, who restored the species to its correct position and status (*Entomologist*, 1931, lxiv, pp. 197-201).—FREDK. J. KILLINGTON; 22, Litchfield Road, Bitterne Park, Southampton.

ODONTAEUS MOBILICORNIS (COL.) IN DORSET.—In the Rev. E. J. Pearce's List of the Coleoptera of Dorset the only record for the county of the Scarabaeid *Odontaeus mobilicornis* is one specimen from Bloxworth Heath by Mr. A. W. Pickard-Cambridge. I believe the beetle is far from being abundant or widely distributed: I remember as a boy being filled with a feeling tantamount to awe when I learned that it was being taken in the Wellington College district. I am glad to be able to record a second example from the county. It was attracted to my table lamp on August 26th, 1930, at Rookery Farm, Farnham, close to the Wiltshire boundary. I presented the insect to the Rev. E. J. Pearce.—H. L. ANDREWES; The Warren, Bere Regis, Dorset.

PACHYCNEMA HIPPOCASTANARIA: TIMES OF APPEARANCE.—I have taken imagines of this species on Oxshott Heath, Surrey, each month from March to October inclusive, but not in the same year. In 1913 it was abundant and in fresh condition on March 22nd, and fairly plentiful and fresh on July 19th and September 13th of that year. On March 30th, 1907, it was extremely abundant and in good condition. Larvae taken in October have produced moths in the following March. The species has been noted as fairly plentiful in April, May and August, but I have come across it only in twos and threes in the months of June and October.—A. A. W. BUCKSTONE; 5, Haynt Walk, Merton Park, S.W. 20, January 8th, 1932.

RECENT LITERATURE.

Butterfly and Moth Book. By HELEN ROBERTSON-MILLER. Revised and enlarged edition. New York: Charles Scribner's Sons, 1931. Pp. xxiv + 286. Text illustrated.

Of the forty-two short chapters which make up this popular book on North American Lepidoptera six are entirely new. Each deals with the life-history of one or occasionally several species of butterfly or moth, and they all attain a very high standard of accuracy, which is refreshing in a work the appeal of which is obviously to the non-technical public. The species are chiefly, but by no means entirely, the larger and more conspicuous Emperor or Silk Moths, Hawk Moths, Swallowtail and other butterflies, of the kinds most likely to arouse the curiosity of the tyro and perhaps kindle a genuine and lasting interest. Perhaps the best chapters are those which appear to be amongst the first to have been written, when Miss Robertson-Miller's own early entomological thrills were both many and frequent, such as the descriptions of the Moon Moth (*Actias luna*, Chapter V) and of the Painted Lady (Chapter XXVI). An excellent account of the little Tineid moth, *Pronuba yuccasella*, which deliberately pollinates the Yucca and so ensures the ripening of seed for its progeny to feed upon, is included. Chapter XLI records the results of much patient work upon an aquatic moth larva (*Bellura gortynides*), which bores in the stems of pond-lilies and appears to be equally at home on land or in water, swimming freely from plant to plant as necessity arises. Other interesting chapters deal with the *Poinsettia* and its guests, Psychidae, *Cyaniris argiolus* and its seasonal variation, *Danaida plexippus*, etc. The book is well planned to illustrate many of the wider interests of a study of butterflies and moths, and few opportunities of directing attention to them are missed. The make-up is good, and the numerous illustrations, with very few exceptions, excellent.

The Lepidoptera of Northumberland and the Eastern Borders.

The concluding parts (3-5) of Mr. GEORGE BOLAM'S excellent account of the Lepidoptera of Northumberland, Berwickshire and Roxburghshire carry on the work from *Asthenia* in the Geometridae to the end of the Tineina. The number of species dealt with in the various groups are: Geometridae, 181; Pyralidina (including the Plumes), 96; Tortricina, 218; Tineina, 333. The grand total, including those in the Addenda, appears to be 1120. The author's combing of the old records appears to have been very thorough, and the results, linked with his own observations made over a considerable period of years, and supplemented by information from many willing helpers, are presented in an attractive manner not usually characteristic of faunistic papers. There is much matter in this catalogue, and it should provide a sound basis for further work in the district with which it is concerned. Notices of the earlier parts will be found in vols. lx, 1927, p. 118, and lxii, 1929, p. 235.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, November 4th, 1931.*—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Election of Fellows.*—The following were elected Honorary Fellows of the Society: Dr. Walther Horn, 20, Gosslerstrasse, Berlin-Dahlem, Germany; M. René Oberthür, Rennes, Ille-et-Vilaine, France. The following were elected Ordinary Fellows of the Society: J. W. Cowland, Wellcome Tropical Research Laboratories, Khartoum, Sudan; Denys Melville Farrell, Department of Agriculture, Trinidad, B.W.I.; Col. G. K. Gregson, D.S.O., Cob Orchard, Plaxtol, Kent; Prof. S. T. Issiki, School of Agriculture, Taihoku University, Formosa, Japan; Prof. John Graham Kerr, The University, Glasgow; W. B. R. Laidlaw, Forestry Department, The University, Aberdeen; Louis André Moutia, 57, Avenue d'Italie, Paris, France; Walter Reginald Brook Oliver, Dominion Museum, Wellington, N.Z.; Kenneth Lewis Palmer, Meadowlea, Gobowen, Shropshire; Tarlton Rayment, Bow-worrung, Sandringham, Victoria, Australia.—*Exhibits.*—Sir Guy A. K. Marshall, C.M.G., F.R.S., on behalf of Dr. R. J. Tillyard, F.R.S., and Mr. G. A. Currie (Senior Entomologist, Canberra, Australia), exhibited photographs illustrating oviposition stimuli of the Burr Seed Fly, *Euaresta aequalis*, Loew. Mr. N. D. Riley exhibited and made remarks on two specimens of the continental butterfly, *Pararge maera*, taken at Shrewsbury by Mr. Clive Tanner. Prof. E. B. Poulton, F.R.S., exhibited and made remarks on (1) *Acraeas* settling for the night in a small grassy space in Portuguese East Africa; (2) a specimen of the Silver-striped Hawkmoth (*Hippotion celerio*) taken on a motor car that had been driven from Nuneaton to Oxford; (3) observations, nearly eighty years old, on Pompilid wasps and spiders in California.

Wednesday, November 18th, 1931.—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Nominations.*—The Secretary read the following list of Fellows nominated by the Council for the ensuing year: *President*, H. Eltringham, M.A., D.Sc., F.R.S.; *Treasurer*, Capt. A. F. Hemming, C.B.E.; *Secretary*, S. A. Neave, M.A., D.Sc. Other members of Council: H. W. Andrews, Capt. E. Bagwell-Purefoy, F.Z.S., Sir T. Hudson Beare, B.Sc., F.R.S.E., K. G. Blair, B.Sc., G. H. Carpenter, D.Sc., M.R.I.A., H. StJ. K. Donisthorpe, F.Z.S., Major R. W. G. Hingston, M.C., A. D. Imms, M.A., Sc.D., F.R.S., R. W. Lloyd, Miss Cynthia Longfield, Sir Guy A. K. Marshall, C.M.G., D.Sc., F.R.S., Prof. E. B. Poulton, M.A., D.Sc., F.R.S., O. W. Richards, M.A., and V. B. Wigglesworth, M.A., B.Ch., M.D.—*Election of Fellows.*—The following were elected Fellows of the Society: Assad Daoud Hanna, 53, Fairholme Road, W. 14; Gilmour Donald Irving, 7, Mapesbury Road, N.W. 2.—*Exhibits.*—Dr. V. B. Wigglesworth described and exhibited a curious entomological "pill-box." Mr. J. A. Simes exhibited a series of the Hesperiid butterfly *Heteropterus morpheus* from Charente, France. Mr. B. M. Hobby made remarks on the courtship and the predacious habits of *Dioctria rufipes* and *D. atricapilla* (Dipt., Asilidae). Mr. O. W. Richards made remarks on some insect inhabitants of a Mediterranean beach. Dr. G. D. Hale Carpenter described (1) a new *Acraea* illustrating apparently

discontinuous distribution: (2) a mimetic association from East Africa. Prof. E. B. Poulton, F.R.S., described (1) observations made by Mr. R. A. Lever and Mr. H. W. Simmonds on male Euploeine butterflies attracted to *Tounefortia argentea* in Fiji; (2) further records made by Mr. G. Fox Wilson of *M. stellatarum* attracted to pictures of flowers; (3) an Aculeate model of a mimetic Colombian moth collected by Dr. George Salt; (4) observations made by Mr. O. H. Latter on the insect enemies of the bee, *Osmia rufa*; (5) Diptera (Milichiidae) bred from the nest of the bee *Anthophora pilipes* by Mr. A. H. Hamm; (6) observations made by Mr. J. C. Green and Mr. R. J. Flintoff on hive bees occupying a hole in a chestnut tree in which a jackdaw was nesting; (7) observations made by A. R. Wallace and H. W. Bates on the River Amazon; (8) a detailed list of the dates of publication of the parts of Westwood's *Introduction to the Study of Entomology*, prepared by the Registrar. Mr. K. Mellanby (a visitor) gave an account, illustrated by lantern-slides, of the death of insects in dry and moist air.—S. A. NEAVE, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—November 12th, 1931.—The President in the Chair.—The decease of Mr. E. Step, who joined the Society in 1872, a few months after its inception, was announced.—Mr. Wakely exhibited a short series of *Polyploca diluta* taken at light around Wimbledon; Mr. Buckstone, an American species of cockroach taken among bananas; Mr. R. Adkin, a short series of *Epunda lichenea* taken at light at Eastbourne, and read notes on its occurrence around that town.

November 26th, 1931.—The President in the Chair.—Messrs. F. Ballard, of Kingston, and W. D. T. Young, of Carshalton Beeches, were elected members. Mr. R. Adkin communicated a report of the meeting of the British Association in London in September last. Mr. Downes exhibited bred examples of *Thera obeliscata*, ova of *T. juniperata* from Riddlesdown, with imagines of the same species, larvae of *Cerigo matura* from Riddlesdown and ova of *Himera pennaria* from Wimbledon; Mr. Syme, the woodland cockroach *Ectobius panzeri* and var. *nigripes* from Brockenhurst; Mr. Buckstone, bred examples of *Pyrameis cardui* from Herne Bay and Oxshott, one smoky and striated, the other with extra spots below.

December 10th, 1931.—The President in the Chair.—Messrs. B. J. MacNulty, R. W. Atwood and D. A. Nicholson were elected members. Mr. Downes exhibited young larvae of *Lasiocampa quercus* and of *Triphaena janthina* from ova laid by females captured at Salcombe and Westerham respectively; Dr. Bull, a series of *Anathes lunosa* showing much variation. Miss L. Cheesman gave a lecture on her experiences when collecting in the New Hebrides, illustrated by numerous lantern-slides.—H. J. TURNER (*Hon. Editor of Proceedings*).

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*Exhibition Meeting.* October 20th, 1931.—As this was the Annual Exhibition Meeting, it was devoted to the inspection of exhibits brought by the members. The scarcity of Lepidoptera in many parts of the country during a remarkably wet, cold and sunless season was commented upon, but those members who had collected in the south-eastern

counties had found insects more numerous, and some good series of local and rare species had been secured. Despite the poor reports, exhibits were quite as numerous and varied as usual. *Exhibits*.—Mr. R. Tait showed bred series of *Pachys strataria* and *Asphalia ridens* from the New Forest, and from Dorset series of *Agriades bellargus*, *Polyommatus icarus*, *Lycaena astrarche*, *Cupido minima*, *Melitaea aurinia* and *Ino statites*. Mr. W. Buckley exhibited *Agriades corydon*, *Lycaena astrarche* and *Chiasmia clathrata* from Royston; from Symonds Yat he had *Brenthis selene*, *Leucophasia sinapis*, and bred specimens of *Zygaena filipendulae* of a dull, greasy appearance; the same member also showed examples of *Chrysophanus phlaeas* from Nevin with only a trace of the usual orange band on the hind wings. Mr. and Mrs. A. W. Hughes, who had had a particularly productive season, brought a very large exhibit representative of captures made up to July. These included, from localities in Surrey—*Apocheima hispidaria*, *Lycia hirtaria*, *Hemerophila abruptaria*, *Ephyra pendularia*; *Tephrosia punctularia*, *Boarmia consortaria*, *B. roboraria*, *Euchloris pustulata*, *Drymonia trimacula*, *Toxocampa pastinum*, *Calymnia pyralina*, *Dyschorista suspecta*, and a specimen of *Tryphaena pronuba* with partly bleached fore wings; from Essex—*Brephos notha*; from Wye, Kent—*Pachetia leucophaea*, *Lobophora sexalisata* and *Anaitis efformata*; from the New Forest: *Sesia culiciformis* (bred), *Apamea ophiogramma* (bred), *Callimorpha dominula* (bred), *Boarmia cinctaria* and *Pachycnema hippocastearia*; from Lewes, Sussex—*Acidalia immorata*; from the Isle of Wight—*Endrosa irrorella*, *Acidalia humiliata*, *Agrotis lunigera*, *Xylophasia sublustris* and *Acosmetia caliginosa*. Mr. J. B. Garner-Richards brought an exhibit from the Isle of Wight including *Colias croceus* and *Polygonia c-album*, and also a golden variety of *Chrysophanus phlaeas* from Formby. Mr. W. Mansbridge exhibited, on behalf of Mr. A. R. Davidson, a specimen of *Phryxus livornica* taken at Formby in June, and Mr. G. de C. Fraser exhibited one of two specimens of the same species captured at rhododendron flowers in his garden at Freshfield during the same month. Mr. R. N. Snell had *Pachys strataria* from Dolgelly, a variable series of *Nyssia zonaria* from Conway and *Hibernia leucophaearia* from Eastham; from Symonds Yat—*Leucophasia sinapis*, *Abraxas sylvata*, *Anaitis plagiata*, *Minoa murinata* and *Epione advenaria*; from Wicken—*Arsiloonche albovenosa*, *Phragmatobia fuliginosa* and *Calamia phragmitidis*; from Abbots' Wood—*Lymantria monacha* (including specimens with yellow bodies), *Aspilates ochrearia*, *Drepana binaria* and specimens of *Nola albula*, *Eremobia ochroleuca* and *Lithosia complana*, and also bred examples of *Pterostoma palpina* from Devon. Mr. H. W. Wilson exhibited a bred series of *Callimorpha quadri-punctaria* (red, yellow and intermediate forms) from Devon, and from the same county *Xanthorhoë rivata* and *Acidalia imitaria*; from Wallasey—*Taeniocampa opima* and a specimen of *Boarmia repandata*, variety *nigra*; from Burnt Wood—*Bomolocha fontis* and *Semiothisa notata*, and a long varied series of *Calamia lutosa* from South Lancashire. Mr. G. A. Longworth showed specimens of *Lithomoia solidaginis* from Mœl Fammau, *Dasychira fascelina* (bred) from Formby and *Geometra papilionaria* (bred) from Thurstaston.—H. W. W.

WICKEN FEN AND ITS UPKEEP: AN APPEAL.

BY W. G. SHELDON.

I TAKE it practically every reader of this magazine has at least heard of Wicken Fen, and that most of them know it more or less intimately.

Possessing, as it does, a fauna and flora almost unique so far as Britain is concerned, it became known to entomologists early in the nineteenth century, and from about 1850 was gradually frequented by most of the well-known students and collectors, few of whom have not at some time or other visited it, some of them on many occasions.

About the end of the century a plan was locally formulated to drain and convert it into cornland. Fortunately for nature lovers this plan did not materialize, for an entomologist, the late G. H. Verrall, seizing an opportunity that offered, purchased the greater part, some 240 acres, and at his death in 1911, to his eternal honour, left it to the Nation.

The National Trust, at that date quite a young body, already holding certain small portions of the Fen, accepted custodianship of Verrall's bequest. Since his death other benefactors, prominent amongst whom was the late N. Charles Rothschild, purchased and handed over to the Trust large portions of Wicken Fen, and of the adjoining Burwell Fen, so that now over 600 acres are secured as a sanctuary for the fauna and flora for ever.

It is a rule of the National Trust only to accept custodianship of those properties offered to it that are sufficiently endowed to cover the expense of their maintenance. They are compelled to make this stipulation, because almost their entire funds are swallowed up by the cost of maintaining the properties they hold.

When Verrall bequeathed his interest in Wicken Fen to the Nation, the value of the produce, sedge, reed and litter was considerable, quite sufficient to cover the cost of maintenance, and therefore he did not provide a further endowment, nor did the Trust think it necessary to stipulate for one.

Unfortunately for Wicken this produce is, and for a number of years has been, practically valueless, because, owing to the horse having so largely been superseded by the motor, and slate and tile roofs being substituted for the picturesque thatch of former times, there is very little demand for it; there is the further unforeseen difficulty that the cost of providing watchers and labour to clear the Fen has greatly increased since the Great War. To crown all,

a drainage scheme for the whole district entails upon the custodians a heavy rate—they have to pay a contribution based upon the acreage they hold—for the purpose of draining the district, in spite of the fact that it is a necessity for the welfare of Wicken Fen to keep as much water in its subsoil as possible! This scheme was not even thought of in Verrall's time.

At present, instead of the absolutely necessary expenditure on maintenance being provided by the sale of produce, there is annually a large deficit, which has hitherto been made good, partly by gifts, and partly out of the very small contingency funds of the Trust.

It is the very laudable practice of the National Trust to administer the properties they hold in accordance with the wishes of the donor or donors in all cases in which they are known or can be inferred; and, since the chief donors of Wicken, Verrall and Rothschild, were entomologists, they have decided that whilst the plant and bird life must be carefully studied and safeguarded, Wicken Fen must be regarded primarily as an insect reserve and sanctuary.

Is it not therefore incumbent on entomologists to help to provide the upkeep as far as possible? So far they have rendered generous and much appreciated assistance. In 1913 my friend the late Henry Rowland Brown started a fund to assist, and up to the end of 1917 had handed over to the Trust more than one hundred pounds. Just then his duties in connection with the war did not permit him to continue his efforts for Wicken, and at his request I took over his work. At first my participation was understood to be of only a temporary nature, but his health unfortunately breaking down shortly afterwards, I have assumed responsibility for the fund he started until the present time. Since 1913, through what has been known as the "Wicken Fen Fund," entomologists have contributed to the upkeep of the Fen the large sum of £1620 5s. 11d., all of which, with the exception of the cost of stationery, postage and printing, amounting to £49 8s. 6d., has been handed to the custodians, and spent by them upon upkeep.

Unfortunately the necessity for help continues, and there are good reasons why it is now more important than it has ever been. Wicken is not a fen as usually understood; that is to say, it is not an uncultivated area consisting mainly of quaking bog and mere and alder and sallow carr, but a stretch that from time immemorial, certainly for several centuries, has been subjected to cultivation of a highly specialized nature. It is a series of meadows in which the principal growth is sedge, reed, and the many flowering plants peculiar to such situations. These, when the crops had value, were mown every few years, and the bush growth, consisting mainly of sallow, alder buckthorn and guelder rose, was grubbed up.

It will be realized what an enormous amount of labour is required to deal in this way with several hundreds of acres of such terrain, and how costly it is: and it by reason of want of funds or other cause the labour is not available, then the bushes, the seeds being distributed by birds or other agents, will in a comparatively few years spread over the whole area, forming an impenetrable thicket, killing off the flowering plants, and of course exterminating the insects dependent upon them. There is a melancholy instance of this state of affairs in another Nature reserve not so far away, *i. e.* at Wood Walton Fen, in Huntingdonshire. I visited Wood Walton two years ago and this is what I saw. The Fen has an area of several hundreds of acres, which formerly had much the same growth and cultivation as Wicken, but owing to similar causes, cultivation ceased some twenty or thirty years ago, and the land was allowed to run wild. At the time of my visit, except for a small portion that had been recently cleared to provide a suitable habitat for a colony of the large copper butterfly, then being established there, the whole fen was one vast thicket, mainly of willow, so thick that the bushes had strangled and killed each other, and over the dead and dying stems and branches there grew a thick pall of brambles and common white convolvulus. It was a hideous wilderness, utterly useless to man, or plant, or insect.

The wonderfully rich and interesting insect fauna of Wicken depends entirely for its well-being upon the plants sustaining it having adequate sun and light and space to flourish in, so that the balance of life due to the system of cultivation obtaining in the past shall continue to exist. Unfortunately, owing to want of funds, it has not been possible to keep the whole of the ground clear, and thus many of the most interesting species of insects are either extinct or much less abundant than formerly. I understand an effort is now being made to carry out more clearing, especially during the summer months, during which it is most important it should be done, but the extent to which this is possible depends entirely upon the amount of funds available.

An attempt was made some years ago to raise an endowment fund of ten thousand pounds, but the appeal was not by any means so successful as was hoped, and although the income arising out of the money subscribed helps, it does not go very far. Circumstances being as they are, it still devolves upon entomologists—and of course all others interested in the fauna and flora of the Fen—not only to continue their efforts, but to increase them where possible.

The fund for which I have been responsible for the last fourteen years has been contributed by about one hundred subscribers each year, but there are many more than one hundred entomologists in Britain, to each one of whom Wicken Fen is, or should be, of great

importance, and I venture to appeal to all those, who have not hitherto helped, now to give assistance, and to those who have already generously given, to continue their support. Wicken Fen is a precious national asset, given mainly by entomologists for the benefit of entomologists of the present time, and of future generations. It is a small and almost unique remnant of a bygone age, which, once spoilt or destroyed, can never be recreated.

I regret the amount of the fund in 1931 was considerably less than it has been for several years. I trust all will rally round it, and that the help given during the present year will be substantially more. Subscriptions are earnestly requested from everyone who is able to contribute; however small, they will be gratefully received, and should be sent to me at the following address: West Watch, Oxted, Surrey. A financial statement and list of contributors is sent each year to all subscribers.

February 13th. 1932

ONE SUMMER HOUR.—In the past inclement season, when one heard little but complaints of the abnormal scarcity of butterflies, it is pleasant to be able to record an abundance, even though local. At the western end of the Parade here is an almost precipitous bank; it is not primeval, but it is very old—evidently the side of an old chalk-pit. When I first knew it, some seventy years ago, the foundations of the old lime-kilns were still standing, the floor of the pit was grass grown and two or three trees of some age grew at its upper end; it must have been out of use for many years even then. Although the pit has been transformed into a recreation ground and a tea chalet built at its lower extremity, the bank still maintains its natural wild flora, in addition to which a few plants of red valerian and garden scabious have established themselves. At about noon on August 9th I visited this bank; it faces due south. The sun was shining brightly and a light northerly breeze was blowing. On my way there along the Parade I noticed a few odd specimens of *Pieris brassicae*, *P. rapae* and *Colias croceus* flying wildly, but on the bank they were in dozens, feeding at the flowers or flitting gently between them; *Pyrameis cardui* and *Aglais urticae* were equally common. The bank has been a haunt of *Polyommatus thetis* (*bellargus*) so long as I have known it, and it is gratifying to know that it still lingers there; I saw several specimens, as well as a few *P. icarus*. The flowers and the butterflies made the whole bank a mass of scintillating colour, as pretty a sight as I have seen for many a long day. On a subsequent visit a few days later the butterflies were somewhat less numerous, but the places of the absentees were more than taken by hosts of *Plusia gamma*. *Pyrameis atalanta* and *Vanessa io* were not represented, but a few specimens were noted in my garden; neither species was, however, particularly common last autumn.—ROBERT ADKIN; Eastbourne, October, 1931.



A. S. BUGHNIRET PHOTO

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COCOONS OF *PARASCOTIA FULIGINARIA*. x247.

ON THE LARVAL HABITS OF *PARASCOTIA FULIGINARIA*, L.

BY E. ERNEST GREEN.

(Plate II.)

LARVAE of this species were first found in Britain, according to William Buckler (*Larvae of British Butterflies and Moths*, vol. vii, p. 47), in 1882. The discoverer appears to have been a Mr. Edward Upton. Mr. W. H. Tugwell, who was taken by Mr. Upton to the site of the discovery, describes his experience in the following words (*loc. cit.*, p. 50): "We were conducted to an old wooden building in Bermondsey, near the river, to a spot most difficult of approach, in an obscure light, consequent on its position; and there, after a short search, Mr. Upton showed us the larva apparently feeding. . . . The food appeared to be a black, sooty-looking fungus or mould. . . . Mr. Upton broke off a portion of this fungus-covered rotten wood, and, removing one of the larvae, gave it to me to bring home; and I have had the great satisfaction of seeing it not only eat, but thrive upon the fungus for the past three weeks." A specimen of the fungus was forwarded to Dr. M. C. Cooke, who pronounced it to be "an effused Muscledine." He was unable to determine the genus, as the fungus "was not then in the stage of development necessary for identification."*

Although examples of the moth have been taken, from time to time, in our southern counties, I believe I am correct in stating that the above account describes the last (and possibly the only) occasion upon which the larva has been seen in this country. Now, after an interval of approximately fifty years, I am able to record its re-discovery.

During my residence in Camberley, extending over sixteen years, I have taken annually one or more specimens of the moth, and during the whole of that period I have been trying to find the natural habitat of the insect. My premises are surrounded by pine and birch woods, far removed from anything in the nature of old wooden buildings, and remote from a river or any other piece of water. From the regularity of the appearance of the moth at light in my house, I was convinced that it must be breeding in the immediate vicinity. At first I had an idea that the larva might be feeding in or upon *Polyporus betulae*, which occurs, abundantly, upon moribund birch trees in the surrounding woods. But persistent examination of these fungi was completely unproductive. I knew exactly what to look for, as there are excellent figures of the larva on plate cxlvii, vol. viii, of Buckler's work. The neighbouring woods

* See Tugwell, *Entom.*, xvii, p. 153, 1884.—Guenée (*Hist. Nat.*, ix, p. 331) also described the larva in 1857.

and fields, and my garden itself, abound with fungi of many kinds; but most of these do not put in an appearance until late summer and autumn, by which time the insect has completed its transformations. I have on several occasions succeeded in obtaining ova from captured females, and kept the resulting larvae alive until after the first moult. Then they died off, one by one, before going into hibernation. This failure was probably due to unsuitable food. I tried them with various agarics and other fungi and supplied them with mycelia from decayed wood and dead leaves. They consistently refused to touch the matured fungi, but browsed—somewhat discontentedly—upon the mycelium. Finally, I kept them going, for a time, upon the spores of a *Uredo* that was infesting the foliage of the currant bushes in my garden. They appeared to be satisfied with this pabulum; but the result was as noted above. Mr. L. W. Newman, who also obtained eggs from a female supplied by me, was equally unsuccessful in his attempts to rear the larvae.

Some three years ago an old birch tree was felled on my premises. As the trunk was gnarled and knotted, I allowed it to remain where it fell—partly for use as a temporary seat, and partly with the idea that it might eventually form a trap for insects of all kinds. Since then I have, at intervals, turned over and examined both the log and the ground beneath it, but, until the recent fortunate occasion, without finding anything of special interest. Meanwhile, a growth of Polyporid fungi (since determined as *Polystictus versicolor* Linn.) developed on the bark.

A few weeks ago (to be exact, on May 14th) I pointed out this log to Mr. J. C. F. Fryer, with whom I had been discussing the repeated occurrences of the moth in my house, and mentioned that I regarded it as a likely habitat for the larva of *fuliginaria*. We, then and there, proceeded to turn over the log and, while examining the fungi, a slight movement, not on the fungus itself, but on an adjacent area of the rough bark, betrayed the presence of a small dusky caterpillar, which I immediately recognized as the object of my prolonged search. This initial discovery sharpened our eyes and, in quick succession, we detected others. "Detection" is the appropriate word, for the cryptic coloration of the larvae (blackish, with small orange-coloured spots) formed such a perfect protection that, had it not been for the movement of the first individual, their presence might well have been overlooked. After the first discovery we found others on areas that we had already explored. Though the larvae were usually resting quite exposed upon the bark, they appeared to be associated with clusters of the *Polystictus*. In captivity the caterpillars feed readily upon the under-parts of this fungus, the resulting excreta being whitish. Mr. Fryer informs me that the larvae taken away by him fed and

flourished upon another fungus which was identified as *Corticium laeve* (Pers.) Quel.

Polystictus versicolor is one of the small "bracket fungi." It is described in Masee's *British Fungi and Lichens* (p. 380) as having the "pileus horizontal, thin, rigid, more or less semicircular and narrowed at the point of attachment, densely velvety, shining, zoned with various colours." The texture and coloration describe the upper surface only, the under-surface being whitish, softer and porous. *Corticium laeve* is described (*loc. cit.*, p. 415) as follows: "Closely adnate, thin, edge radiating, but not fibrillose; hymenium hyaline, white when dry. Often originating as small, roundish, scattered patches, which soon extend into each other."

When first observed, in the middle of May, the larvae were about half an inch in length. When fully grown the largest (probably females) scarcely exceeded one inch. Others (? males) were satisfied with a maximum length of three-quarters of an inch. Those most advanced constructed cocoons early in June, and all had pupated before the end of that month. The caterpillars are very sluggish and, so long as they are provided with appropriate food, show no disposition to wander.

The description and figures of the larva, as given in Buckler's volumes (*loc. cit.*), need no revision. They provide an excellent representation of its appearance. But the published account of the behaviour of the insect, at the time of pupation, does not accord either with my experience or with that of Mr. Fryer. Mr. Tugwell says: "When full-fed it spins up in the crevices of the rotten wood, and forms a fairly compact cocoon of greyish silk, the outside being coated with particles of fragments of wood and dried fungus." Mr. Fryer and I found that, when allowed the opportunity, the cocoons are freely suspended by a silken cable at each end, from the under-surface of a piece of bark (as clearly shown in Plate II, which has been reproduced from an excellent photograph by Mr. A. S. Buckhurst). The picture represents the cocoons enlarged by 2.57 diameters. I should describe them as being of rather loose texture, the outside coated with earthy matter, fragments of fungus and bark, and pellets of excreta. The cocoon itself is about five-eighths of an inch long, and the two points of attachment are at a distance from each other of approximately one inch. The contained pupa is of a pale olivaceous brown colour, slender, and half an inch in length.

Similarly suspended cocoons were subsequently found, *in situ*, attached to the under-surface of the Birch log and, later, others were discovered on a prone Pine tree upon which was a luxuriant growth of *Polystictus versicolor*. A fair number of these cocoons were left to mature and carry on the breed.

Moths commenced to emerge, in captivity, on July 1st, and the

last made its appearance on the 24th of the same month. The sexes were about equally divided. My experience, over sixteen years, shows the period of flight to extend throughout the greater part of July and August. My earliest capture is dated "3rd July" and the latest "20th August." The moth usually comes to light between 11 o'clock and midnight. It apparently flies low, for I have noticed that all my specimens have been caught in rooms on the ground floor. Though I have worked, far more constantly, with light on the third floor, not a single example of the insect has been taken there.

The method of suspension of these cocoons reminds me of a similar habit of a fungus-eating caterpillar in Ceylon. The following note, "On the Larva of *Panilla albopunctata*, Wlk.," was published in *Spolia Zeylanica*, vol. vii, pt. xxvii, May, 1911, p. 162: "The larva of this Noctuid moth feeds commonly on the under-surface of a large Polyporid fungus that vegetates on decaying stumps of trees. The caterpillar is of the normal form of *Quadrifine* larvae, having only two pairs of abdominal claspers, and, when young, may easily be mistaken for that of a *Geometrid* moth. Its coloration renders it very inconspicuous, being of a pale translucent ochreous tint, usually with an irregular blackish blotch on the dorsum of the fourth and fifth segments, and a similar mark on the seventh and eighth segments. It is of a rather slender cylindrical form and carries a few colourless hairs. Pupation takes place in a compact cocoon composed of pellets of the excreta of the caterpillar, which vary in colour with that of the fungus upon which it has been feeding. The cocoon is usually attached to the under-surface of the fungus. It may be suspended by a short cord at one extremity, or may be attached at both extremities."

Such a similarity of larval and pupal habits is suggestive of a closer affinity between the two species than would appear from the positions in which they are, at present, placed. *Panilla* occupies a place amongst the *Quadrifinae*, while *Parascotia* is referred to the *Deltoidinae*. It is noticeable that the resting position of *Parascotia* (with fully expanded wings) is unlike that assumed by the majority of *Hypenidae*.

Camberley;
August 4th, 1931.

PLUSIA NI IN GLAMORGAN.—On June 11th, 1931, I netted in our garden here a nice specimen of *Plusia ni*, which was flying over the flowers of red valerian (*Centranthus ruber*) at dusk. This is the first record of the species in Glamorgan and, so far as I know, only the second in Wales, an example having been taken at Tenby in 1906.—W. E. Cox; 98, Marlborough Road, Cardiff.

LEPIDOPTERA COLLECTING NOTES.

(March to the end of September, 1931.)

By C. G. M. DE WORMS, F.E.S.

AFTER a fairly mild February, the month of March opened in proverbial manner with one of the bleakest periods on record for the time of year. The result was that the appearance of all the early spring species was much retarded, and it was not till the first half of the month was over that collecting could be resumed. On the 15th a few *Apocheima hispidaria* came to the sheet in the Berkshire woods, but it was not until the 21st that this species was in full force and as plentiful as in 1930. On this occasion we took over thirty male specimens. *Polyplocia flavicornis*, however, was much less abundant than in the previous season. On the 22nd *Brephos parthenas* was flying in numbers on all the birch-covered heaths in the district, and on the same day the first *Taeniocampas* were observed.

On the week-end of March 28th to 30th I visited the Midlands. In spite of cold weather, sallow was fairly productive in the Peterborough area. The night of March 30th was very mild, and I beat a large number of the commoner *Taeniocampas* from sallow in one of the Huntingdon woods. I also found a good many ova of *Zephyrus betulae* deposited in the forks of the lower sloe bushes. Over the Easter period, April 2nd to 6th, I was in the New Forest, but unfortunately the weather turned out to be as unpropitious as possible. There was only one fine day, but I managed to make the most of the bad conditions. There were quite a number of species at sallow, and on the 4th I beat a *Lithophane semibrunnea*, also a few *Graptolitha ornithopus* and *Xylocampa areola*. On the same day there were a fair number of *Polygonia c-album* flying in the rides, though not so many as in 1930. On Easter Sunday, the 5th, in spite of a deluge, Mr. D. S. Palmer and myself obtained a good many larvae of *Melitaea aurima* in one of its western localities.

The night of April 7th proved extremely good for sugar in the Berkshire woods. I counted over 80 *Taeniocampa munda*, of every variety, on the patches, as well as a few *T. rubricosa* and one *Orrhodra rubigneae*. *Pachys strataria* also came freely to the car headlights. On the 9th *Biston hirtaria* was common on lime trees in the West End of London, and I was also surprised to find a *Tephrosia bistortata* in one of the London squares. I was in France for the next fortnight and did not resume my activities over here till April 25th, when I spent the week-end at Folkestone. On visiting some neighbouring woods we found *Taeniocampa miniosa* in fair numbers

on sallow, while a few *Lobophora carpinata* and *Anticlea nigrofasciaria* were taken on the wing. On the 26th I found larvae of *Callimorpha dominula* common in one of its well-known Kentish haunts.

The first week-end of May, 2nd and 3rd, I spent at Ventnor, where larvae of *Melitaea cinxia* were for the most part just full-fed and quite abundant. On the undercliff there were innumerable webs of larvae of *Liparis chrysorrhoea* and a few *Lasiocampa quercus*. At night *Cidaria suffumata* was flying round the low bushes. In spite of fine weather there were no butterflies on the wing, and it was not till we visited some of the Surrey woods on May 10th that we saw the first spring species. On this occasion I saw *Euchloë cardamines*, *Leucophasia sinapis*, *Pararge egeria* and *Hesperia malvae*. On May 16th, together with friends, I visited some woods in South Hampshire. Unfortunately the weather was too dull for anything to be on the wing, so that recourse was taken to larva-beating. We obtained quite a number of *Trichiura crataegi*, together with a few *Poecilocampa populi*, *Catocala promissa* and *Geometra papilionaria*. I saw the first *Argynnis euphrosyne* on the 20th in the Surrey Woods—a very late date compared with the normal time of appearance of this species.

During the early part of May I made a good many captures on the road lamps. Chief among these were *Polyphoca ridens* (May 10th), *Eucosmia certata*, *Eupithecia abbreviata* and *Hemerophila abruptaria*.

Over the Whitsun period, in company with friends, I visited the Midlands. On May 23rd and 24th, in spite of very rainy conditions, we managed to beat between thirty and forty full-fed larvae of *Thecla pruni*. As in 1930, larvae of *Trichiura crataegi*, *Brachionycha sphinx*, etc., were very plentiful, but there was a general absence of *Thecla quercus* larvae, so abundant in the previous season. Whit Monday, 25th, which was fine, was spent in haunts where *Carterocephalus palaemon* was just coming out, and Mr. D. S. Palmer, who was with me, was fortunate enough in taking a very fine aberration of this species, having most of the golden spots replaced by black.

The last week-end of May 30th to 31st, I spent at Eastbourne. On Sunday, 31st, I saw the first *Argynnis selene*, while there were a good many immigrant *Pyrameis cardui* on the wing, one of which I got to lay very prolifically on thistle, but most of the brood died off when half grown. On the same afternoon I motored along the coast to Dungeness, where I found several larvae of *Dasychira fascelina* and *Lasiocampa trifolii*.

During the latter half of May some very good nights were experienced with light, on the 17th, 20th, and 26th in the local woods near here, and on the 27th at Netley Heath, Horsley. The

chief species noted on these occasions were *Notodonta trepida*, *Lophopteryx camelina*, *Dasychira pudibunda*, *Drepana falcatoria*, *Nola confusalis*, *Acronycta coryli*, *Cucullia chamomillae* (17th), *Pericoma flavofasciata*, *P. affinitata* and *Pachycnemis hippocastanaria*.

The month of June opened with some very mild weather, and the night of the 2nd proved again to be very good for light on the Berkshire border. Insects came very freely to the sheet, and the chief captures included 2 *Notodonta trepida*, 3 *Drymonia trimacula*, 1 ♀ *Pterostoma palpina*, a large number of *Dasychira pudibunda*, also *Drepana binaria*, *Eucosmia certata*, *Pericoma flavofasciata*, and *Boarmia consortaria*. On June 5th I was again in the New Forest, and in spite of a downpour I took several *Drymonia trimacula* that night at the car headlights. On the 6th I visited a Dorset locality, where *Melitaea aurina* was flying in considerable numbers. *Lycaena bellargus* was only just emerging, but *L. astrarche*, *Zizera minima* and *Nemeobius lucina* were well on the wing. On the same evening in the Forest *Thyatira batis* came freely to sugar, while *Epione advenaria* was taken at light.

On June 12th I paid my first visit of the season to Wicken Fen, where two nights were fairly productive. The sugar was very sparsely frequented, but the main captures at the sheet were *Sphinx ligustri*, *Smerinthus ocellatus*, *S. populi*, *Dicranura vinula*, *Pygaera pigra*, *Meliana flammea*, *Earias chlorana*, *Coenocalpe vittata* and *Macrogaster castaneae*. During the week-end two specimens of *Hydrilla palustris* were taken by other collectors.

On June 20th I motored up to some of the Huntingdon woods, where *Thecla pruni* was just out and flying in as great numbers as in the two previous seasons. I captured several quite perfect specimens. Larvae of *Thecla betulae* were, however, much scarcer than usual. The same evening I proceeded to the Breck-sand district, where I took one *Metopsilus porcellus* on the wing, and also saw several *Dianthoecia irregularis* flying over the Viper's Bugloss. The same night I motored on to Wicken, but the visit was very unproductive. Captures by other collectors on this occasion included *Spilosoma urticae* and *Senta maritima*. On the way home on the 21st I found full-fed larvae of *Cucullia verbasci* on the Great Mullein.

On the 26th, a warm night, I took several *Chaerocampa elpenor* and one *Plusia pulchrina* flying over honeysuckle in the garden here. On the 30th I got a series of *Melitaea athalia* in a locality (not in Kent) where they were very abundant.

From July 2nd to the 6th I was again at Folkestone, and I was much indebted to Mr. A. M. Morley for conducting me to some of the best localities in that district. On the evening of the 2nd I had no difficulty in taking a very fresh series of *Tapinostola bondii*

in its usual haunts. July 3rd was a warm day and very good for collecting. In a wood in the Canterbury area I took an *Aphantopus hyperantus*, almost ab. *caeca*. On the same afternoon I found *Melitaea othalia* flying in appreciable numbers, but it had disappeared from a spot where I had taken it in 1927, as the food-plant had been entirely choked by the undergrowth, and this I think is the only reason for the disappearance of this species from some of its former haunts. The evening of the 3rd was spent in the Warren, but the night turned out very cold and there was very little at sugar. I took, however, on the wing, *Pyrrhia umbra*, *Melanthia procellata*, *Aspilates gilvaria* and *Hepialus humuli*. On the afternoon of the 4th I accompanied the Folkestone Natural History Society on an excursion to Shakespeare Cliff. On the return journey I found *Melanargia galathea* just emerging and also took *Endrosa irrorella* on the wing, and picked up a *Sesia chrysidiformis* basking on a chalk path.

The same evening Mr. Morley and myself visited some woods in the Ashford district, and the night turned out to be one of the best for collecting at light that I have experienced. From 11 p.m. to 1 a.m. it was as much as we could do to catch the insects fast enough. The chief species taken were *Pheosia tremula* (♀), *Palimpsestis* or, *P. duplaris*, some 30 *Mitochrista miniata*, *Acronycta leporina*, *Noctua brunnea*, *Herminia derivalis*, large numbers of *Euchloris pustulata*, *Iodis lactearia*, *Cleora lichenaria*, and a good many *Boarmia roboraria*. The following day, the 5th, I took a nice series of *Scotosia vetulata* in the same area. That evening I went over to Dungeness. The atmosphere was very close and a good deal was flying. I found one *Dasychira fascelina* at rest, while *Mamestra dentina* and *Dianthoecia carpophaga* came to light.

On July 7th I saw the first *Argynnis paphia*, *A. adippe* and *A. aglaia* of the season in Berkshire. *Limenitis sibilla* was also just making its appearance, but seemed much scarcer than in previous years. This I found to be the case when I made another journey to the New Forest on July 11th. I stayed there till the 15th, but the weather for day work was very unfavourable and I hardly saw any sun during my visit. There were a good many *A. adippe* flying in the clearings, but *A. paphia* were much less in evidence than is usual for that part of July and I did not see a single var. *valesina*. I heard later that the main emergence of *A. paphia* was in the first week in August. However, to compensate for the poor sport by day, night work proved much more successful. The night of July 11th was one of the best of the season for light. Some friends and myself were kept very busy from 11 p.m. till dawn in one of the rides near Cadnam. The less common species taken on this occasion included 3 *Stauropus fagi*, *Bombyx rubi* (♀),

about 20 *Nola strigula*, a good many *Mitochrista miniata*, *Bomolocha fontis*, *Cidaria fulvata*, *Cleora lichenaria*, and a large number of *Boarmia roboraria*, as many as fourteen being noted on the sheet at once, including two females. On the following night near Brockenhurst captures at the sheet included *Notodonta dromedarius*, *Cleora jubata*, and a female *Cossus cossus*. On the 14th near Lyndhurst I took a nice series of *Lycaena aegon* which contained several blue-shot females.

I went to Wicken again on July 20th. It was a bad night, and the only species at the sheet were *Malacosoma neustria*, *Arctia caja*, *Nudaria senes*, *Lithosia griseola*, *Herminia cribrumalis* and *Acidalia immutata*. The last ten days of July were extremely wet, making collecting quite impossible, and my activities were not resumed till August 1st. On this date I motored to some Hampshire woods in a vain search for *Apatura iris*. Over the Bank-holiday period and on subsequent week-ends during August visits were paid to a locality where *Agriades corydon* was very abundant. Some friends and myself were fortunate enough in taking some very fine both upper and underside aberrations in both sexes of this species. On August 15th *Hesperia comma* was well out at Boxhill. On the same day I travelled down to Folkestone, where there was very little doing in the daytime except for larva-beating. I got one larva of *Cerura bifida*, full-fed, several *Smerinthus populi* and *Palimpsestis* or. We also found a few *Cucullia asteris* sunning themselves on golden-rod. By night *Lasioampa trifolii* was well on the wing in the district. On this visit I saw and took only one *Colias croceus*, which, however, was quite plentiful towards the end of the month in certain places along the south coast.

On the Berkshire border I had three good collecting nights during August (on the 6th, 11th and 18th). I chose a heathy piece of ground on the edge of a wood, and on each occasion moths came in substantial numbers to the sheet illuminated by car headlights. The better species I took on these nights were *Pheosia dictaeoides* (♀) (on August 6th), *Notodonta ziczac*, *Drepana binaria*, *D. lacertinaria*, *D. falcataria*, *Phragmatobia fuliginosa*, *Mitochrista miniata*, a good many *Lithosia complana*, *Demas coryli*, *Acronycta leporina*, *Agrotis agathina*, *Noctua baja*, *Plusia moneta*, *Acidalia straminata*, *A. inornata*, *Eupithecia goossensiata*, *E. nanata*, *Pelurga comitata*, *Ennomos erosaria* (♀), *E. alniaria*, *Pachycnemia hippocastanaria* and *Gnophos obscurata*.

Towards the end of the month I found at different times 15 larvae of *Chaerocampa elpenor* in the garden here, feeding on two kinds of willow herb. As in 1930, I also shelled out nearly 20 pupae and full-fed larvae of *Nonagria typhae* from bulrushes in our garden pond. Of these six emerged the dark form ab. *fraterna*, three of each sex.

I again visited Folkestone over the first week-end of September, 6th to 7th, but there was very little doing, and *Lycaena bellargus* was much less numerous than in the previous season. I was able to carry out very little collecting over the middle of the month. On September 20th we found quite freshly emerged *Agrades corydon* of either sex in the locality we had been visiting in August. From the 22nd I was once more at Folkestone, staying five days till the 27th. *Lycaena bellargus* was still emerging in fair numbers, but affording hardly any abnormal specimens. On the night of the 22nd some friends and myself took a very good and varied series of *Leucania lutosa*, which were to be found at rest in several reed-beds in the Romney Marsh area. On the following evening, the 23rd, we took between 40 and 50 *Mellinia gilvago* at rest on grass under wych elms in the same district. During this period *Ennomos autumnaria* was fairly common at the lamps in Folkestone itself; *Agrotis saucia* was also moderately plentiful at sugar.

On the 29th I used sugar on the Berkshire border, but the only visitor was *Polia flavicincta*. On the same date I was surprised to take *Tephrosia bistortata*—no doubt a third emergence.

To summarize, in conclusion it may be said that in spite of a very bad season so far as weather conditions were concerned, most species both by day and night were fairly well up to the average. Of the butterflies great scarcity was noticeable with *Chrysophanus phlaeas*, *Cyaniris argiolus* and *Hesperia thaulas*, while both broods of *Lycaena bellargus* were everywhere below their usual numbers. Larvae of *Thecla quercus* and *T. betulae* were also far less numerous than usual. Night work was well up to the average for light, but apart from the early period of the season sugar was exceptionally bad and disappointing compared with some previous years, though I have heard of a few nights in August when very good "bags" were recorded.

Milton Park,
Egham;
October 15th, 1931.

GYMNOSCELIS PUMILATA IN JANUARY.—As evidence of the abnormality of the autumn and winter, I think it of interest to report the capture in my sitting-room of a specimen of *Gymnoscelus (Eupithecia) pumilata* on January 18th. It was in perfect condition and had apparently just emerged. I am unable to trace any record of the occurrence of this species in January; I assume that the mildness of the weather has produced offspring from October or November parents, thus virtually making a fourth emergence.—NIGEL T. EASTON; 83, Marine Parade, Brighton.

[Is not a premature emergence of a spring individual more probably the explanation?—ED.]

A SYNOPSIS OF THE BRITISH HYMENOPTEROUS
FAMILY CYNIPIDAE.

BY CLAUDE MORLEY, F.E.S., F.Z.S.

(Continued from p. 40).

Genus ii: HYALASPIS, Htg.

Table of Species.

- (4) 1. Mesonotum nitidulous, not aciculate;
scutellar basal foveae deep.
- (3) 2. Scutellar apex acute and distinctly produced 1. *asmata*, Gir.
- (2) 3. Scutellar apex obtuse and obliquely truncate 2. *scotica*, Cam.
- (1) 4. Mesonotum dull and transalutaceous;
scutellar foveae obsolete 3. *subulifera*, Th.

The last two species occurred to me at Tuddenham Fen in Suffolk on June 5th, 1916, only; they are abundantly distinct. All three were known as indigenous in 1890 solely from Scotland. To these has been added as British *H. petiolata*, Kieff., *Bull. Soc. Ent. France*, 1901, p. 161.

Genus iii: AEGILIPS, Walker.

Entom. Mag., iii, 1836, p. 160

Table of Species.

- (4) 1. Scutellum glabrous basally and upon both sides.
- (3) 2. Legs and antennae flavous; scutellar foveae obsolete 1. *nitidula*.
- (2) 3. Legs and antennae rufescent; scutellar foveae entire 2. *ruficornis*.
- (1) 4. Scutellum rugulose throughout, nowhere nitidulous.
- (8) 5. Mesonotum dull and strongly trans-striolate.
- (7) 6. First and second radial abscissae of subequal length 3. *bicolorata*.
- (6) 7. First abscissa but half as long as second 4. *striolata*.
- (5) 8. Mesonotum pilose and not at all striolate.
- (10) 9. Wings infumate; petiole thrice as long as broad 5. *fumipennis*.
- (9) 10. Wings hyaline; petiole twice as long as broad 6. *rufipes*.

"The species [cf. *Ent. Mag.*, 1836, p. 161] of *Aegilips* are often to be seen on windows and in gardens, being attached to *Muscidae*" (Marshall, *Ent. Annual*, 1874, p. 120), and are founded on much better characters than those of the foregoing two genera; but

certainly *Ae. nitidula*, Dalm., is a great deal less frequently met with "in houses" than Cameron represents: I have not seen it alive. *Ae. ruficornis*, Cam., has turned up in Renfrew, on whitethorn blossom at the end of May, 1899, in Ipswich (Platten) and by sweeping reeds at Potters Bridge near Southwold on September 20th, 1913, from which we may surmise that it hibernates in the imago state. I took a ♂, the only described sex (*Ent. Mo. Mag.*, 1887, p. 194) of Cameron's *Ae. bicolorata* that was sitting on a lime leaf among the Aphids *Pterocallis tiliae* on July 10th, 1910, in my Monks Soham garden; the ♀, which differs only sexually. I swept at Killarney in Ireland on June 7th, 1913. *Ae. striolata*, Cam., has occurred singly in early August as well as at Tuddenham Fen in early June. No *Ae. funipennis*. Westw., have appeared since the unique Oxford type: and all my other material is Westwood's fairly common *Ae. rufipes*. This is from Felden in Herts (Piffard), Tostock in Suffolk on September 8th, 1900 (Tuck), Sherwood Forest in Notts in August, 1914, Thorndon on hazel and my Monks Soham garden on lime leaves in June and house-windows during the middle of August, as though there were two pretty definite summer broods. I can contribute nothing to Marshall's above vague economy, overlooked by Cameron.

Tribe ONYCHIDES.

Genus iv: ONCHYCHIA, Westw.

Our single species of this Tribe, *Onychia westwoodi*, Dalb., has hitherto been regarded of extreme rarity, probably because in 1890 it was known with us solely from Norwich (Bridgman). It is certainly uncommon, for so large an insect (4½ mm., with an expanse of 9 mm.) is not readily overlooked by any hymenopterist; I possess it in Piffard's Collection from Felden in Herts, and have seen others that were captured by Lance Carr at Lichfield in Stafford during 1920 and Saunt during August, 1922, at "Brandon," presumably in Warwick. As to its economy, we seem to have got no further than Leop. Kirschner's 1867 record: "Ich erzog vier Stücke aus *Blattkäfer*-larven, welche auf *Caltha palustris* frassen. Gefangen in der Vorderbrühl nächst Wien" (*Cat. Hym. Europ.*, p. 37). I know only seven phytophagous beetles on marsh marigold, three species of *Prasocuris* and *Hydrothassa* (*Helodes*, Kalt.) and four *Donaciae*: of these it seems most likely that *O. westwoodi* attacks *P. phelandrii*, Linn., an addition to coleopterous parasitism (*Trans. Ent. Soc.*, 1911, p. 472).

Tribe FIGITIDES.

TABLE OF GENERA.

- | | |
|--|-----------------------|
| (2) 1. Eyes stoutly and elongately pilose. | . v. <i>Figites</i> . |
| (1) 2. Eyes subglabrous | |

- (6) 3. Cheeks not margined. nor scutellar base
bifoveate
- (5) 4. Scutellar base unifovent; head and
thorax nitidulous vi. *Lonchidia*.
- (4) 5. Scutellar base not foveate; head and
thorax dull vii. *Anolytus*.
- (3) 6. Cheeks margined and scutellar base
bifoveate.
- (8) 7. Thorax finely granulate and dull viii. *Amblynotus*.
- (7) 8. Thorax nitidulous.
- (10) 9. Scutellum rugulose; second segment
pilose; areolet incomplete ix. *Sarothrus*.
- (9) 10. Scutellum and second segment glabrous;
areolet entire x. *Melanips*.

Genus v: FIGITES, Latr.

- (4) 1. Mesonotal apex longitudinally sulcate
centrally; scutellum entirely rugose.
- (3) 2. Notauli themselves laterally carinate;
pleurae striate only below 1. *scutellaris*.
- (2) 3. Notauli not carinate; pleurae striate
throughout 2. *consobrinus*.
- (1) 4. Mesonotal apex not sulcate; scutellum
rugulose only towards apex.
- (8) 5. Mesosternum carinate above; second seg-
ment striolate
- (7) 6. Vertex punctate; mesonotal disc sulcate
to centre 3. *anthomyiarum*.
- (6) 7. Vertex glabrous: mesonotum sulcate only
at base 4. *nitens*.
- (5) 8. Mesosternum not carinate; second seg-
ment glabrous (*Pycnotrichia*) 5. *urticarum*.

(To be continued.)

PERONEA HASTIANA IN YORKSHIRE.—While searching for moths on Strensall Common near York on July 22nd last, I found that a good many of the terminal tips of the Dwarf Sallow were infested with larvae. A good many of them proved to be *Pygaera pigra*; but I also found with them larvae of a *Peronea*, which, spinning up in early August, emerged from August 20th to September 16th as a rather large, dark form of *P. hastiana*, mostly near form *autumnana*. From the dates given it would appear that *hastiana* is single-brooded in this district, the times being very close to those bred from Scotch larvae.—W. G. CLUTTEN; 136, Coal Clough Lane, Burnley, Lancs.

HELIOTHIS PELTIGERA IN LANCASHIRE.—On September 20th last I took a fine specimen of *Heliothis peltigera* at light here. This moth appears to be quite rare in the north.—N. L. BIRKETT; The Cottage, Kilner Park, Ulverston.

ON THE PAIRING OF *SIALIS FULIGINOSA* PICT.
(NEUROPTERA : MEGALOPTERA).

BY FREDK. J. KILLINGTON, F.E.S.

AN attempt was made last spring to arrange a pairing of *Sialis*, the species used being *S. fuliginosa* Pict. The first successful pairing occurred on the morning of June 14th. and during the week that followed several other pairings were observed, both during the day and in the evening, all similar in the main details.

Of four females and four males placed in an observation case on the morning of June 14th, two females and one male were apparently ready for pairing. The females began at once to twitch the abdomen upwards at intervals, and the male responded by similar movements. After some moments the male began to walk round the case, and presently encountered one of the "calling" females. For a few seconds their antennae vibrated together. The female then walked a short distance, the male hurrying after her; she stopped, and he at once pushed his head under the apices of her wings, forced up the end of her abdomen with his head, and then, knocking her abdomen up several times with the back of his head and creeping still further under her abdomen, came into position for copulation. During this operation the male's right foreleg was raised above his head and used to hold the female's abdomen. (In one pairing the left foreleg was used, and in another both forelegs.) He now turned his abdomen under one pair of his wings and curled it over dorsally until the genitalia of both insects gripped. The four wings of the male were thus pushed over to one side. Almost at once the female could be seen to be levering from the male a large whitish spermatophore, her hind legs gripping the male to aid the process. The pair presented an extraordinarily entangled appearance. After a minute the male twisted himself until he was turned over on the back of his thorax; a further twist and he had righted himself, but was now facing in a direction opposite to that of the female. The pair then disengaged and the female was seen with the spermatophore held under the end of her abdomen. The actual pairing had occupied not more than a minute and a half to two minutes. After a rest of a few minutes the female curled her abdomen under her thorax and between her legs, so that she rested, with legs well spread, on the dorsal surface of the posterior part of the abdomen, and commenced eating the spermatophore.

The particular interest in the pairing of *Sialis* is the devouring by the female of the spermatophore, a habit which is seen in at least certain members of the Planipennia sub-order of the Neuroptera, e. g. *Osmylus fulvicephalus* Scop. and *Symphorobius pygmaeus*

Ramb. Although such a habit in different groups may be the result of convergence, it is sufficiently striking to be weighed as evidence in considering the exact relationship of the two groups Megaloptera and Planipennia which are sometimes made to form two distinct orders.

NOTES AND OBSERVATIONS.

UNCAPPED BORINGS OF *SENIA ANDRENAEFORMIS*.—On p. 27 of the February *Entomologist* Mr. H. L. Andrewes concludes his interesting notes on uncapped borings of *Sesia andrenaeformis* by saying that the possible explanation is a sexual one. I think my experience disproves this theory, as last year I kept separate a number of uncapped "mines" of *S. andrenaeformis* from which moths of both sexes emerged in about equal numbers.—JAMES W. WOOLHOUSE (jun.); Hill House, Frances Street, Chesham, Bucks.

EARLY EMERGENCES.—This morning, January 21st, I found a male *Hybernia marginaria* dead in a cobweb in a wood here. I imagine this to be an early date for its emergence, although the weather is so warm. *Phigalia pedaria* and *H. leucophaearia* are out, and *H. defoliaria* still lingers.—F. S. ANDRUS; Hartley Court, Longfield, Kent.

THE CRAMBID, *EROMENE OCELLEA*. IN CO. CORK.—I received, on January 27th this year, from my sister, Mrs. G. E. Lucas, a box of moths, among which was a worn specimen of *Eromene ocella*, Haw., taken at Timoleague on January 23rd, 1932. The moth was seen flying on a moonlight night, knocked down by the hand and retrieved from the ground by the help of a torch-light. On examination I found it to be a Crambid unknown to me, and as I was unaware of any of this family flying in winter, I considered it must be an unusual insect. I referred to Barrett and discovered it was *Eromene ocella*; its figure on plate 432 was poor, but the description convincing. Leech's figure in his *British Pyralides* was better, but South's figure, by Horace Knight, in the *Entomologist* of 1890, Pl. IV, fig. 11, left no doubt of the identity of the moth.

This Crambid has been taken (including the one under notice) on ten occasions in our islands:

1. London, in the suburbs, in extremely early spring, *circa* 1812, by Haworth, and called by him *Palparia ocella* (the Necklace Veneer).

2. Glamorgan, March, 1861. Stainton.

3. Dumfries, 1865.

4. Three near Liverpool, March, 1869.

5. Folkestone, August, 1879. Sydney Webb.

6. New Forest, February 21st, 1899. H. Ashby.

7. Grange-over-Sands, Lancashire, October 5th, 1921. A. E. Wright (*Entomologist*, 1922, p. 38).

8. Charmouth, Dorset, May 3rd, 1923, by Dr. Lang. N. D. Riley (*Entomologist*, 1924, p. 90).

9. New Forest, September 11th, 1928, by Mr. E. S. Craske. J. W. Metcalfe (*Entomologist*, 1929, p. 78).

I am sending my specimen, unset as received, to the Editor for the favour of his remarks on my identification and of its disposal as he deems fit.—C. DONOVAN, Lt.-Col., I.M.S. (retired); Bourton-on-the-Water, Glos, February 2nd, 1932.

[The identification has kindly been verified by my colleague, Mr. W. H. T. Tams, who is adding the specimen to the British Collection in the British Museum (Natural History).—N. D. R.]

ARTIFICIAL BREEDING-PLACES FOR ARBOREAL MOSQUITOES.—In the December number of the *Entomologist* (lxiv, p. 283) I recorded the appearance of a third instar larva of the arboreal mosquito *Aedes geniculatus* in the water of one of our "artificial tree-holes"—a chiselled-out cavity in a piece of lime tree. As there have now been further developments in connection with these experiments, I am venturing to send the following additional records. On December 1st we made a more thorough search for larvae—the entire contents of each tree-hole being temporarily transferred through a siphon into a glass tank for examination. By this means we found that the water in the lime-tree hole in question contained five larvae (including second, third and fourth instars) of *Aedes geniculatus*, and also three larvae (including second and third instars) of *Anopheles plumbeus*. On the same date we also found larvae in an artificial cavity in a piece of beech tree, namely, one larva (third instar) of *Aedes geniculatus* and nine larvae (including second and third instars) of *Anopheles plumbeus*. The pH of the water in this beech-tree cavity has been determined at fortnightly intervals throughout the past eight months, during which period it has varied from 7.0 to 7.4—the lower figure, however, being recorded only three times. As stated in my previous letter, *Aedes geniculatus* is hardly ever found in Hayling Island. *Anopheles plumbeus* is even more rare; the number of adults taken in the course of ten years' continuous collecting amount to five, while larvae in a natural breeding-place have been located on one occasion only.—JOHN F. MARSHALL, M.A.; Director, British Mosquito Control Institute, Hayling Island.

FORCING OF *HELIOTHIS PELTIGERA* PUPAE.—Early in September I visited the East Kent coast and collected a small number of larvae of *Heliothis peltigera* on *Senecio viscosus*, in a locality where in July they had been very plentiful in all stages of growth. I had taken the precaution of planting in my garden some roots of the groundsel mentioned, a lesson gained by my having previously lost a number of larvae of this species through inability to replenish their natural food-plant. When found on *S. viscosus* they appear to refuse all substitutes. The few pupae obtained (several larvae were ichneumonised) were exposed to outside temperatures till October 20th,

at which time there was no indication of any development of the imago. They were then brought indoors and subjected to dry heat, the method adopted being the simple one of placing the earthenware pot containing the pupae on the mantelpiece above a range. The average temperature obtained during the day was 85° F., with a minimum night temperature of 70°. The imagines emerged on and between November 3rd and 7th, the actual forcing period thus being very short. They were uniformly pale examples with faint markings, differing very strikingly from those bred earlier in the year under normal conditions.—G. W. WYNN; The Old Cottage, Buxted, Sussex.

THE LEPIDOPTERA OF AN ESSEX WOOD.—If Mr. Nicholson was interested in my notes on Ongar Park Wood, I can assure him that the feeling was reciprocated when I read his article under the above title in the January *Entomologist*. Such comprehensive records of localities that are passing are very valuable from the historical point of view.

I only visited "Lark's Wood" three times in the early "nineties"—each time for treacling—as in those motorless days it was as inaccessible from Highgate, as was Ongar Park Wood for Mr. Nicholson from Clapton. Its quiet remoteness was indeed remarkable for a wood practically in London, and the list of species Mr. Nicholson gives us may be almost as unbelievable to a future generation as to us are the records of bygone days from the now extinct Hammersmith Marshes. Strange to say, on my last visit, August 3rd, 1894, I took single specimens of two species not mentioned by Mr. Nicholson, viz. *Agrotis tritici* and *A. obscura*. 1894 was a famous year for the latter species, and it turned up in all sorts of strange places. On my first visit, July 19th, in the abnormally early year of 1893 (when *Argynnis adippe* and *Limenitis sibylla* were seen in the New Forest in the latter days of May), I had a remarkable experience with *Cosmia affinis*, which Mr. Nicholson says became scarce after 1892. Possibly owing to the early season he missed it in 1893, but on the night in question it swarmed. My diary record reads: "Treacle on by 8 o'clock and moths came at once. *C. affinis* was the first and was very abundant, variable, and fresh—frequently seven or eight on a tree, and once eleven." Some were so spotted with white that I took them to be *C. diffinis*—a species I had never taken at that time. A week later—on July 28th—I treacled in the wood again, hoping to get *diffinis*, but unsuccessfully. Moths were fewer and only three *affinis* occurred. Two female *Chortodes arcuosa* were taken this night—interesting from the fact that Mr. Nicholson had not seen it after 1887. Four *Catocala nupta* also were taken—another instance of the early season—and are only mentioned because Mr. Nicholson apparently never saw more than two on a night.

Referring again to *Cosmia diffinis*, I have always found it an exceedingly difficult species to obtain. I have taken *C. affinis* commonly in many localities, and can always beat larvae of this and the reputedly much rarer *C. pyralina* in a pet locality, but although

I continue to hope, have never beaten *diffinis* larvae; nor have I ever taken the moth on treacle. In fact, in some fifty years' collecting, my sole personal capture is one specimen at rest on a fence. As I love taking an insect myself, if any kind friend would give me a hint, the confidence would be respected and much appreciated.

I never again visited Lark's Wood since 1894. I often see it on its hill as I motor by and have sometimes thought of re-exploring it, but after Mr. Nicholson's description of it as it is to-day, I will let well alone. It shall remain in my memory as a happy impression of the past as does a pleasant dream.—RUSSELL JAMES, F.E.S.; Dial Cottage, Ongar Park, Essex.

ECCENTRICITIES OF THE SEASON 1931.—The following untimely captures must, I suppose, be regarded as delayed emergences due to the cold, wet summer. I took at light—perfectly fresh—*Bombyx neustria* on October 4th, and *Abraxas grossulariata* on October 5th. On the other hand, I took *Pachnobia rubricosa* on October 3rd. Some years ago Mr. Percy Richards recorded an autumnal capture of this species at Hythe, so that it is perhaps more liable than other *Taenio-campids* to be misled by a warm spell following a cold September. Other results of the wet, cold season were the appearance of *Pararge egera* for the first time in the three years I have been here in this wood and in my garden on September 29th, and the irregularity and extreme lateness of *Polygona c-album*. I took one on July 12th, of the summer form *hutchinsoni*, and saw one on August 24th—not examined. While *Pyrameis atalanta* and *cardui* and *Aglais urticae* attended the Buddleia, and later the Michaelmas Daisies in September, *P. c-album* did not appear till October, when the other species had largely disappeared. As late as October 15th I saw five at once, and no other butterfly, and on October 7th they were on the flowers as early as 8.20 a.m. On September 22nd I took *Plusia festucae* flying at flowers in the garden at midday; I had seen what I felt sure was this species in the marshes a few days before flying at water-ragwort. Is it habitually a diurnal flier? It has not often been recorded from this island, and was evidently a second brood. Of immigrants *Colias croceus* and *P. cardui* appeared freely, but had a miserable season. Besides *Phryxus livornica*, already recorded, I took *Heliothis peltigera* at Red Valerian on July 3rd. On June 14th I took an imago of *Mimaesaeoptilus zophodactylus*, and later in the summer collected seed-heads of *Erythraea centaurea* from the same spot. On September 24th I found the second brood emerging. Their ova could not hatch till the middle of October, and the larvae must have fed on old dead seed-heads of the food-plant, which is over by that time. They cannot feed in spring, as the plant is an annual and does not flower till July. It is surprising to find two broods in a year feeding on the seeds of an annual plant.—E. A. C. STOWELL, M.A.; Green Glades, Alverstone, Brading, Isle of Wight.

MOTHS IN STABLES: A CORRECTION.—In my note on "Moths in Stables" (*Entomologist*, lxiv, p. 259) I am afraid I made a slip.

Tinea nigripunctella should be *Tinea fuscipunctella*. I regret the error.—LEONARD T. FORD; St. Michael's, Park Hill, Bexley.

RECENT LITERATURE.

A Practical Handbook of British Beetles. By NORMAN H. JOY, M.R.C.S., L.R.C.P., F.E.S., M.B.O.U. H. F. & G. Witherby. 2 vols. Price £3 3s.

If a serious contribution to scientific entomology is expected the reader will be frankly disappointed; but if we can ignore the scientific aspect and accept the book in the spirit in which it was written, as a help to the collector, and particularly the young collector, in naming his captures, Dr. Joy's book has much to recommend it. The keynote of the whole work is the "practical" of the title, even though this be maintained at the expense of the scientific. The arrangement in two volumes, one of text and one of figures, which work in the one with the other, the copious cross-references, not only from text to figure and *vice versa*, but from genus back to family, all help to facilitate working. The text is arranged entirely in key-form, thus enabling the collector to run down his species with readiness and directing attention to the critical points to be observed, with figures to make these more clear. The drawback to this mode of treatment is the omission, in pursuance of brevity, of general descriptions, but this defect is largely compensated by the wealth of figures, in many cases not only of the complete insect, but outline drawings to illustrate the comparative characters of the keys. The keys are drawn up with the object of taking out each group, whether family, genus or species, as readily as possible, with no attempt at systematic grouping. Even from the "practical" point of view the superiority of this method over a more balanced dichotomy is doubtful; yet, granting this, with the system of cross-references employed a more normal arrangement of the groups could then have been adopted, and would have had the "practical" advantage of falling more into line with the existing lists and text-books. Definite localities are not given, though the distribution as well as the relative scarcity of each species is indicated.

The volumes are well produced; the printing and paper make them a pleasure to handle. Misprints are scarce, though slight *lapsus calami* on the part of the author are more numerous, and we cannot always agree with the latter's conclusions as to the correct name to be used. A case in point is the genus *Alphitobius*, where *laevigatus* F. should be used for *ovatus* Hbst., while *diaperinus* Panz. remains undisturbed for the second species. Dr. Joy seems to have followed Reitter's *European Catalogue* of 1906 without regard for later work. The figures are clear and generally good. Nearly 400 of them are taken from Spry and Shuckard's classical work on *British Coleoptera*, but over 2000 are from original drawings by the author. The plates are frequently ill-balanced, with much wasted space, but this, in part

at least, is due to the "practical" advantage of the plates coinciding with the group treated.

There is no doubt that such a book on British Beetles is badly needed; the idea of Dr. Joy's work is excellent, and though the execution errs perhaps on the side of originality, we are of the opinion that the book should supply a want long felt by the less advanced collector, and provide a definite stimulus to the study of the Coleoptera in this country.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, December 2nd, 1931.*—Mr. H. Willoughby-Ellis, Vice-President, in the Chair.—*Nominations.*—The Secretary read, for the second time, the nominations of the Council for Officers and Council for 1932.—*Election of Fellows.*—The following were elected Fellows of the Society: Ewen Cameron, B.Sc., Farnham House Laboratory, Farnham Royal; Col. H. G. Howorth, C.M.G., "Forest Hill," Bideford, North Devon.—*Wicken Fen.*—The Secretary read a report received from the Society's representatives on the Local Committee of Management of Wicken Fen.—*Exhibits.*—Mr. A. G. B. Russell, M.V.O., exhibited some moths captured at Swanage. Mr. H. J. Turner exhibited and made remarks on some variable British Noctuids. Dr. K. Jordan exhibited a ♀ *Danaida melaneus* from Sikkim, with additional veins in all the wings, and a new species of *Abantis* (Hesperiidae) from Africa, resembling *Danaida chrysippus* in colouring. Mr. M. E. Mosely made some observations on the Ronalds collection and the *Fly-fisher's Entomology*. Mr. B. M. Hobby made remarks on local abundance as a factor governing prey-selection by predacious insects. Prof. E. B. Poulton, F.R.S., made remarks, illustrated by specimens, on (1) doubts about bird attacks, and about the reality of qualities presumably implied by aposematic (warning) colours; (2) a few additional undoubted beak-marks on butterflies' wings; (3) attacks on migrating butterflies observed by Miss C. Longfield; (4) the para-sematic head-like appearance on the Lycaenid hind wing observed and recorded by Mr. C. L. Collenette; (5) on the flight of earwigs; (6) *Pocota apiformis* taken in Huntingdonshire by Mr. J. W. Saunt; (7) the mud nest of a wasp (*Odynerus*) in the bowl of a pipe, photographed by Mr. E. A. Andrewes in Assam. Dr. V. B. Wigglesworth made some observations, illustrated by lantern-slides, on the excretory system of *Rhodnius prolixus*. *Papers.*—The following papers were read: (1) An Extrusible Organ in *Mantispa styriaca*, by H. Eltringham, F.R.S.; (2) New Exotic Species of the Genus *Ecnomus* (Trichoptera), by M. E. Mosely; (3) African Beetles of the Family Carabidae, by A. W. Jobbins Pomeroy; (4) New African Acrididae in the Collection of the British Museum, by N. C. E. Miller; (5) The Influence of Temperature on Life-history of Insects, by E. Janisch, communicated by Mr. B. P. Uvarov; (6) Entomological Expedition to Abyssinia, 1926-27: Hymenoptera, I. Apoidea (exclusive of *Andrena* and *Halictus*), by J. D. Alfken, translated and communicated by Dr. Hugh Scott.—S. A. NEAVE, *Hon. Sec.*

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THE FLYING POWERS OF *MELITAEA AURINIA*.

BY W. PARKINSON CURTIS, F.E.S.

It is unfortunate that on the rare occasions when notes of mine appear in print I should have our good friend, the Rev. G. Wheeler, descending upon me like a ton of bricks, but I am afraid that I do not feel properly crushed. I had not intended to make any further comment, but Mr. Campbell Taylor's note, which is tantamount to the lie direct, coupled with requests from entomological friends who disagree with both gentlemen, compels me to return to the fray.

Now it is extremely easy to indulge in *ex cathedra* statements, it is also extremely easy to accuse one of begging the question, and it is still easier for a difference of opinion expressed pro and con. to degenerate into a personal quarrel, but none of these things will alter facts nor advance the pursuit of accurate knowledge. I trust that neither Mr. Wheeler nor Mr. Campbell Taylor will take personal offence if any word or phrase I use herein may seem to them a little severe.

Mr. Campbell Taylor's note at p. 278 (vol. lxxv, 1931) may be dealt with the more shortly, and I will therefore take it first. Had Mr. Taylor done me the compliment of reading what I wrote carefully, he could never have arrived at the conclusion that my note was based on a single fortuitous occurrence, nor can I see that anything I have ever written should have given Mr. Taylor the notion that I am so far devoid of intelligence as to endeavour to generalize on a single instance. Mr. Taylor must still maintain that this butterfly is not "a sprightly insect capable of flying, etc." I am indifferent to whether Mr. Taylor must do so or not. The solid hard fact is that it is. I know *aurinia* perfectly well, and I have a series captured under the very conditions that Mr. Taylor disbelieves, and must, according to his own statement, continue to disbelieve. Each year since 1926, except last year, when I was too ill to leave my bed, I have seen *aurinia* disporting itself over a large area of open down-land, from 200 ft. to 480 ft. above O.D. It is characteristic of Dorset that sunny weather in spring is always accompanied by a hard wind, usually sufficient to tear the leaves off the birch trees. It is too long a geological and topographical story to explain why, but Mr. Taylor must take it from me that forty years' experience of Dorset collecting has furnished a satisfying explanation of why our sunny weather in early summer is

accompanied by a high wind, and must accept the fact that it is so. *M. aurinia* has to accept it too, and seems to have no particular difficulty in travelling half a mile at five miles per hour against a 20-mile breeze. The actual breeding-ground of this colony, as to which I propose to say more below, is restricted by reason of the restriction of the area covered by the food-plant, but that seems to be no objection to *aurinia* wandering about over an area of approximately a square mile. If it wanders thus far, why not farther?

Mr. Taylor's next few sentences seem to me to lose sight of the *fons et origo* of this discussion. The point, as it appears to me, was not "Does *M. aurinia* travel in congregations like *Captosilia* and *Aphrissa*?" nor was the point "Does it habitually migrate by the movement of numbers of independent individuals after the manner of *Pyrameis cardui* and *Colias croceus*?" The point appears to be, having regard to the allegation of its weak flight, "Is it capable of migrating?" Consequently the suggestion that to prove the capability of a few individuals travelling sufficiently far to found new colonies it is necessary to prove the frequent occurrence and capture, or at any rate observation of numerous individuals, in out-of-the-way places is totally groundless. I agree that if I were to see numerous stray individuals I should unhesitatingly draw the conclusion that the insect was an habitual wanderer, and as such likely to establish itself in fresh localities. The fact that records of such occurrence of strays are not usual leads one to suppose, as *aurinia* is a bright little insect, that wandering is not very frequent; the record of any occurrence of a stray makes it certain that it sometimes does wander.

Dryas paphia, though a very powerful insect, is not, according to my observations, an habitual wanderer, yet it has occurred in my garden miles from its nearest habitat. If *paphia*, why not *aurinia*? *Argynnis latona* has also occurred there, but I regard this insect as an habitual wanderer.

Weakness of flight does not seem to be a bar to wandering, otherwise how can one account for such weak fliers as *Deiopeia pulchella* and *Sterrha sacraria* reaching the Dorsetshire coast at intervals? So much for Mr. Taylor's comments, and Mr. Taylor must take it from me that when I say I have seen a thing, I, in fact, have seen it and have not guessed it, deduced it or dreamt it.

Now for the Rev. Geo. Wheeler. He quite gratuitously assumes that I had ignored modes of transport other than flying. I am not sure what makes him assume this, but I can assure him he is wrong. He admits that I am observant, but I want him to go several steps further. I should prefer an admission that I am an accurate observer, and I should also like Mr. Wheeler to suspect

me of some degree of ability to weigh evidence and to draw deductions from it. For my sins, I have to do that kind of thing not for pleasure, but of hard necessity. I should also like him to believe that I think a statement by him on matters pertaining to the genus *Melitaea* is of sufficient importance to merit close criticism, and much severer criticism than might be accorded to a lesser light.

Referring to the single occurrence in my garden, I naturally assumed that as I know my own locality as well as I do, which fact must be known to the majority of my fellow workers, it would be assumed that I had given due weight to possibilities and rejected them. At most one is dealing with the balance of probabilities, and I rejected the improbables. I did not purport to state reasons for a deduction; I simply stated what seemed to me to be the only possible explanation, as I merely intended a short note. However, I will withdraw the "must," and say that the balance of probabilities is so greatly against any other mode of arriving in my garden that flight is the only practical or believable solution.

I can suggest many methods by which that *aurinia* might have travelled, all of them equally impractical. It might also be possible that the insect was introduced into my neighbourhood as a practical joke, but that is as unlikely as any other method. There are, in fact, few likely modes of transport: (1) Deliberate introduction into the vicinity. Immediately upon the occurrence I inquired of the few entomologists resident within ten miles of me whether they had been breeding *aurinia* or knew of anyone else who had. They all replied in the same way, that they had not and did not know anyone who had, so I ruled out introduction of malice aforethought. (2) I reflected upon the possibility of the insect being brought accidentally from any of the known localities. The West Dorset ones are little known, being mainly on strictly private ground, mostly inaccessible (*i. e.* reached by roads below third class or by crossing land without roads); and from those localities there is nothing to be got tending to the carriage of larvae or pupae by accident, and they are forty miles away. That reduced it to the nearer ones—two of these are not in places where anyone is likely to get anything to take away, nor is anyone likely to go to either place except they be either botanizing or collecting. The third locality produced chalk and might produce loam. There is a small marl-pit there, but it is only very occasionally worked, and that in very small quantities—a cart-load or so of a season—and there is an abundance of chalk procurable many miles nearer Poole. The transport of turf and loam might result in bringing both food-plant and larva. An inspection of the locality showed that no turf had been cut out, and no loam removed. I inquired of certain

gardening neighbours and acquaintances where they procured their loam for gardening. The locality given was one which does not produce *aurinia*, and is, moreover, a well-known source of gardening loam; and I was not surprised to hear that my gardening acquaintances fill their requirements there. (3) Transport by rail, motor car, ship, birds, etc., seems too fantastic to contemplate. Now I ask Mr. Wheeler, what is left but flight? Can he accuse me of jumping to conclusions? Can Mr. Taylor say there is "no must about it"?

Short of seeing an insect start from home and following its every movement, I should have thought that the above facts and inquiries amounted to sufficient circumstantial evidence to justify "must." The fluctuations of *aurinia* in Dorset are interesting, and here I say at once that I am writing on hearsay. According to such collectors as the Rev. Octavius Pickard-Cambridge and Mr. E. Newell Blanchard, whose collecting commenced pretty well a century ago, *aurinia* was widespread in East Dorset. It had disappeared when I started about forty years ago, and the Rev. O. P. Cambridge told me that the Bere Regis and Bloxworth colonies shifted from place to place in the neighbourhood and finally disappeared. He thought that agricultural methods had something to do with it, because the disappearance coincided with the greater use of cutting and mowing-machines and ring rollers, both of which must be disastrous to ground-feeding larvae. I also suspect the great increase in the artificial rearing of that curse to all insect life, the pheasant, which leaves nothing undone in the way of destroying larvae and pupae within its reach. Mr. Castle Russell tells me that during the war he knew of a colony near a game preserve at a time when pheasant-breeding stood at zero; now it has been resumed the colony has disappeared.

In the hilly country of West Dorset, where the ground cannot be worked in the same way and preserving game is less acute, *aurinia* seems, from present position, and what I have heard from old collectors like Mr. W. W. Male, of Bridport, to have maintained its own. It seems, however, to be spreading eastward, and I make Mr. Taylor a present of the fact that the prevailing wind in Dorset is S.W., which would be a great aid to an insect travelling eastward, and a merry flight on a hot day with a strong wind behind would enable many insects to traverse a good many miles (by the way, our spring winds are not usually "dusty"). I think, too, that *aurinia* is not very tolerant of cattle, or disturbance. Mr. Male put me on to a locality in West Dorset. I went to it to find not a sign of *aurinia*, the fields being in possession of a good head of dairy cows. Nearly a mile away I found *aurinia* in a place where Mr. Male said that they did not formerly occur, and I took

him out to see it. He was well acquainted with the actual territory, but said he had not seen *aurinia* there before. Mr. Castle Russell tells me that one of his old colonies was stamped out by cattle.

The last-mentioned West Dorset locality presents points of interest. It consists of a wilderness which, due to heavy faulting in the strata and such-like causes, is furrowed out into valleys about 20 ft. or so deep running parallel to one another, divided by headlands or little hills; distance from centre of valley to centre of valley about 200 yards or so. The valleys are wet and have a good growth of scabious. I noticed that as soon as I entered a valley and commenced to stalk the *aurinia* they betook themselves over the headlands into the next valley. No great flight I agree, but it made me think they were intolerant of interference, and led me to the conclusion that they had forsaken their other locality for this less disturbed one. They did not move off in a body, but as one approached each individual it rose and flitted rapidly over the hillock out of sight, or else flew down the valley and round the end.

The single occurrence in my garden, which I believe to be a wanderer, must be coupled with three others which have come under my notice. In 1895 I captured, in a field three miles out of Poole, a single *aurinia*. At that time I needed the species badly, so I hunted the vicinity, say, for a third of a mile radius exhaustively. No other capture resulted. Each spring for three years I hunted around for *aurinia*, and never saw anything that I could reasonably mistake for it. I have a single specimen taken about the same year on Butt's Lawn, Brockenhurst, by W. S. Brameld: but neither he nor I could repeat the capture there.

In 1902 I was collecting in Germany. A single *aurinia* passed me in a valley leading into the Weser Valley. I gave chase and caught up with it; it was proceeding from west to east at about four to five miles an hour. I suppose it gave me a quarter of a mile run. As the valley looked likely, I hunted it very thoroughly that day and the next without result. Nor did I, in a week's collecting in good weather in that district, strike another specimen. Mr. Castle Russell tells me of a single gravid female taken by him in Sussex, followed by an equally fruitless search for the parent colony; Mr. A. R. Hayward, of two solitary occurrences on a chalk-topped hill, three and a half miles from the nearest colony and due west of it at a time when westerly winds are the prevalent wind. Mr. Fassnidge tells me he also has taken a solitary specimen in much the same way. What explanation is offered? Were these specimens on each occasion the solitary survivors of a brood, or the solitary last individuals of a moribund colony, or were they wanderers? "Wanderers" affords the easy and likely explanation;

the other possibilities stretch the long arm of coincidence to too painful an extent.

I remark that a single female can start a colony, but to start a colony with introduced larvae and pupae (however introduced) requires a considerable number. A single female could, if so disposed, fly a long way. A sufficient number of larvae and pupae of this species would be unlikely to be accidentally introduced.

Now I want to make a few remarks on the history of the area in which *aurinia* occurs on the downland.

This particular place I first became acquainted with in 1895. I collected on it frequently, sometimes twice a week, from 1895 to 1899. In 1900 I was away in London. In 1901 I resumed and worked the locality either alone or in company with Mr. Eustace R. Bankes or Mr. E. Harker Curtis, who also worked it alone. This continued until 1914. During that period no *aurinia* were seen by any one of us. I am positively certain that had the insect been there we should have seen it. I was accordingly most surprised to see it in 1926 in considerable numbers. I have seen it every year except 1930, when I was confined to my bed from May to August. I expect to see it in 1932. It flies over a considerable area, as above stated. I also obtained *Pararge aegeria* v. *aegerides* Stgr. in its company. Investigation showed that both species previously not seen were then established, the one in the lanes or coppices below the Down, the other on the Down.

I was very pleased to observe this extension of habitat for both species. In 1917 both species very fairly abundant in West Dorset, and I surmised that a female from the West Dorset area—aided by a S.W. wind if Mr. Taylor prefers (but not a dusty one; our S.W. winds are soft and wet)—reached the area and deposited ova, and started a colony. Artificial importation of larvae and pupae is too remote to be entertained for a moment. The distance to be travelled would be in the neighbourhood of thirty to forty miles. There is, however, a colony in Wiltshire, seventeen miles north-east, in a similar situation, viz. the slope on a high down. It is possible that a vagrant might arrive thence, but the ground to travel is very difficult, and necessitates crossing three high synclinal ridges with deep valleys between.

So much for my own experience of *aurinia*. Now I propose to quote Mr. William Fassnidge, F.E.S. It must be known to most of the readers of this journal that Mr. Fassnidge is a very energetic and capable field worker of excellent and accurate observational calibre, and with a wide experience gained in England, France and Spain, etc. I called his attention to Mr. Wheeler's criticism of myself, and said, "What do you think of *aurinia* as a flier?" "In sunny weather I have not noticed that it was much easier to catch

than any other *Melitaea*. I do not think it is at all a bad flier." Mr. S. G. Castle Russell's recent note as to his experience in trying to establish colonies goes a long way to confirming the ability to wander.

Mr. Castle Russell writes me as follows: "Anyone who has collected the insect in its wild state will not agree that it is sluggish. On a warm sunny day the insect flies rapidly, practically similarly to *cinxia* and *athalia*." If I err in thinking *aurinia* a sprightly insect it is evident I do not err alone. My wife did most of the catching *aurinia* for me in 1927, as I could not climb the down, owing to a groggy knee: she found them much too fast to run down and had to stalk them. She is an athletic young woman, many years my junior.

My experience of *Melitaea* is limited to the following species: *cinxia*, *aurinia*, *didyma*, *phoebe* and *parthenie*. All are markedly thermotropic, and none more markedly so than *aurinia*. If it is baking hot *aurinia* is very active and very lively, but the slightest veiling of the sun by sea mist and it flags, alternate cloud and sun make it lethargic, the advent of an amount of cloud which leaves the Lycaenidae unaffected sends it down. Of the five species I know I should consider *didyma* the most vigorous, it being quite as quick as *Brenthis euphrosyne*; *cinxia* and *aurinia* are about equal, *parthenie* a little slower, and *phoebe* the slowest of the lot, though my experience of that species is limited. I consider our Isle of Wight *cinxia* a faster flier than the heavier German *cinxia*. The fact that *aurinia* stays in one place and does not, as a rule, range very far is not peculiar, as *cinxia* does the same thing. Mr. Castle Russell remarked to me that he often finds *euphrosyne* restricted to a copse in which it is plentiful, although the next copse, apparently similar, is almost devoid of them, and I have had a similar experience. In fact, *B. euphrosyne* and *selene* swarm at one of the W. Dorset stations for *aurinia*, and stick to the area, few being seen outside.

Turning from *aurinia* to *cinxia*, Mr. Castle Russell tells me that Mr. E. E. Green captured at Camberley some *cinxia*, which were apparently some of those released by Mr. Castle Russell at least ten miles from Camberley. I released 80 in my garden one morning, but by midday every one had gone, and no *cinxia* were seen by me or reported to me that summer. *M. cinxia* has succeeded in crossing the Isle of Wight and the Solent, and for a time maintaining a foothold on the Hampshire Coast, but the colony gradually became undersized and then disappeared. There is one peculiarity about *aurinia* that to my mind has a distinct bearing on its capacity to establish colonies by wandering, and that is its leathery structure, which always reminds me of the genus *Parnassius*, as its shape and feathered body do. It is well known that *Parnassius* is very

positively thermotropic, and is very capable of dealing with gusty winds—in fact it lives in very windy places. It is well known to be extremely tenacious of life. I suggest that this same leathery structure may readily afford *aurinia* assistance in withstanding the buffeting of a high wind, and in retaining vitality during cloudy and cold periods, and thus enable it, if on its travels, to take advantage of the sunny intervals, in which it moves with the grace and rapidity with which I have seen it move on many occasions, and which is so reminiscent of the sailing flight of *Limenitis sibilla*—another wanderer which has also increased its range in Dorset.

EULYPE HASTATA IN SURREY.—In the February issue of the *Entomologist* (p. 35), Mr. H. L. Andrewes states that he has an idea that *Eulype hastata* must be much more plentiful and widespread than it was formerly. Mr. Andrewes's surmise would appear to be correct, judging by my experience of the species in Surrey, in which county I had collected Lepidoptera for over thirty years without coming across *hastata* until about twenty years ago, when I captured an individual at Peaslake. Subsequent hard work failed to procure another, although it has become abundant there during the past few years. The following season I took a few near Gomshall, which is about three miles, roughly, north of Peaslake, and two years later found it plentiful in the wooded country lying between Gomshall, Horsley and Dorking. Subsequently the species appeared near Oxshott, where it has become quite common; and last season several were taken at Woking. Until twenty years ago I had failed to take it in the above-mentioned localities. *Hastata* has been plentiful near Witley for several seasons past.—A. W. BUCKSTONE; 5, Haynt Walk, Merton Park, S.W. 20.

EROMENE OCELLEA IN BRITAIN.—With reference to the note by Lt.-Col. Donovan in the *Entomologist* (p. 67) on *Eromene ocella*, in addition to the one I took on October 5th, 1921 (*Entomologist*, 1922, p. 38), I have three from the late Sydney Webb's collection, the labels on which read as follows: (1) Folkestone, Aug. 4, 1879, self; (2) 1867, 20th Jany, St. Helens, I. of W., J. Rogers; (3) Bond collection. The first is mentioned in the list given by your contributor, and the third may be one of those recorded and sent to Mr. Bond, but the other, taken by Mr. Rogers, is additional, and interesting in confirming the capture of this insect during the winter months. This will increase the list of captures of this species in our islands to eleven.—ALBERT E. WRIGHT; Brunleigh, Kents Bank Road, Grange-over-Sands.

PYRAUSTA NUBILALIS, HUBN., IN GLAMORGAN.—On the evening of June 23rd, 1931, I disturbed from herbage and netted a fine specimen of *P. nubilalis* at Castell Coch, Glam., this being the first record of the species in this neighbourhood.—W. E. COX; 98, Marlborough Road, Cardiff.

RHOPALOCERA IN THE NEW FOREST AND ELSEWHERE
IN 1931.

BY BRIGADIER-GENERAL B. H. COOKE, C.M.G., C.B.E., D.S.O.

THE season of 1931 was a most disappointing one in the New Forest. Not having spent a summer collecting in England for many years, it is possible that one expected too much after being accustomed to the large and varied "bags" which are to be made on the Continent. However that may be, the fact remains that on the nights that I tried sugaring in the New Forest and in the Isle of Wight, not one single moth came to the sugar, although conditions appeared favourable in each case. As regards light, I had a powerful lamp backed by a white sheet at my window (which overlooked favourable ground on the outskirts of Lyndhurst), practically every night from early May to the end of July, but on only one night, June 11th, did moths come in any numbers. On the occasions when I took a lamp and sheet into the Forest, or in August to the very favourable ground around Brading Harbour in the Isle of Wight, only a sprinkling of common moths was attracted. The same dearth of insects was noticeable at sallow in April. Night after night produced scarcely anything.

The conditions were better as regards butterflies, though most species were late in appearing. *Cyaniris argiolus* was abundant round Lyndhurst in May, the first being seen on April 30th, on which date *Pararge aegeria* also appeared for the first time. On May 14th and 18th I took a short series of *Boarmia cinctaria*, assisted by Mr. W. Fassnidge, who kindly showed me where they are to be found on the stunted pine trunks, and about then a few *Drepana cultraria* were flying around the beech woods. *Callophrys rubi* was first seen on May 21st, and *Nisoniades tages* and *Hesperia malvae* on the 25th. *Plusia gamma* appeared on May 20th, and from then on into September was abundant wherever I collected, in Hampshire, Dorsetshire and the Isle of Wight. I suppose, from the number of reports that appear of the capture of this insect in England, that its appearance is uncertain, but this year it seemed almost as common as I have always found it everywhere on the Continent, where it is generally a pest.

During May a few hibernated *Polygonia c-album* were to be seen, and *Brenthis euphrosyne* was fairly plentiful from May 27th, but less so than *B. selene*, which I first took on June 15th. *Hemaris fuciformis* and *tityus* were fairly plentiful during June, though I saw only very few of the former on the rhododendron and azalea; both species were to be found on the rough flowery ground along the Southern Railway and in flowery meadows. On June 18th and 20th we took a good series of the bluish female of *Agriades bellargus*

on the Dorsetshire downs, one or two nearly approaching *ab. ceronus*. In the same locality *Colias croceus* was flying, and *Aricia medon*, *Cupido minima* and *Melitaea aurinia* were fairly plentiful. I also obtained 14 full-grown larvae of *Parasemia plantaginis* from the same number of eggs laid by a female taken there. They pupated in early September and commenced to emerge in mid-September.

I should like to mention here that during a visit to this neighbourhood I was surprised to find that although *Melitaea aurinia* was plentiful and fresh, a number of specimens had transparent patches on their wings. Later in the morning a respectable-looking young man with net in hand came up and said that he hoped I was not collecting typical *aurinia*, as he had been "smudging" (I think he said) their wings to avoid trouble in searching for aberrations. I was so surprised that I am afraid I was rather curt in my reply. I am wondering whether this practice is common among collectors in this country; I am glad to say I have never come across it abroad. To my mind it is disgusting and unsportsmanlike; one might as well, when deer-stalking, pay keepers to saw off the horns of indifferent "heads" to avoid a little trouble. I understand that an argument in favour of this practice is that it prevents the slaughter of an unnecessary number of specimens. That argument I decline to accept for a moment. To begin with it is not necessary to kill a single specimen more than is needed if the insects are boxed, examined, and released if not required. Secondly, if this process were really unavoidable in order to secure aberrations, surely it would be preferable that a collector should fail to add aberrations to his collection (or money to his pocket) than that the countryside should be defaced by wretched disfigured butterflies.

From the middle of June onwards I began to search for *Zygæna meliloti* in what have been its known haunts, but although the search continued until well on in July, not a single specimen was to be seen. I understand that it has been practically exterminated by over-collecting on the part of certain dealers a few years ago, who sat round day after day watching for the insects to hatch out and walk into their nets. Let us hope, if this tale be true, that they are thoroughly ashamed of themselves.

Plebeius ægon was abundant everywhere on the heather commencing from June 25th. *Argynnis adippe*, *Dryas paphia* and *Limenitis sibylla* were first seen on July 1st and became increasingly plentiful. *A. adippe* was more abundant in the Forest than I have ever seen it elsewhere. I took several *ab. valezina* close to Lyndhurst, and others further afield, but it appeared to be far from common this year. The first fresh *Polygonia c-album* was seen on July 16th, but I saw very few during the rest of the month. On the same day *Argynnis aglaia* was first taken, but appeared to be

scarce in the Forest this year. *Aphantopus hyperantus* was abundant from about July 12th, and *Epinephele tithonus* and *Hipparchia semele* from July 19th. The emergence of the latter species must spread over a very considerable period, as I was still taking males in good condition in the Isle of Wight in early September.

On August 1st I visited the downs in the neighbourhood of Swanage, and found *Adopaea actaeon* exceedingly abundant in long grass at the foot of the downs, and got a fine series of both sexes. *Argynnis aglaia* and *Melanargia galathea* were also abundant on the downs, and the first male *coridon* was taken. On August 3rd the first fresh *Pyrameis cardui* was seen, though a number of hibernated specimens were about almost everywhere in the spring. Later in the month it was abundant in the Isle of Wight. *Zephyrus quercus* and *Gonepteryx rhamni* appeared first on August 3rd, hibernated specimens of the latter having been abundant in the spring.

We left the New Forest on August 4th. During that month *Melanargia galathea* and *Agriades coridon* were abundant on the downs in the Isle of Wight, near Sandown. A few *Colias croceus* were to be seen, but were far from common, and one belated *Limenitis sibylla* was flying near a belt of oak trees near Bembridge on August 13th. *Vanessa io* and *urticae* and *Pyrameis atalanta* were to be seen here and there during the month, but not in abundance, and some fine blue female forms of *Lycaena icarus* were taken. The second brood of *Agriades bellargus* was not seen by me till September 7th, and seemed very local and scarce. The half-dozen fresh females which I took were all similar. They were rather small, with blue scales at the base of all wings, and a sprinkling of blue scales over both fore and hind wings. The outer margin of the hind wings contains a blue patch between veins 1 and 4, and there is only the faintest trace of orange dots in this area, and none elsewhere. I do not know if this form is peculiar to the Isle of Wight; it is quite unlike any of the varied series I took in Dorsetshire, nor is it mentioned in Frohawk.

I spent four days, June 5th to 8th, at Wicken Fen, where an east wind was blowing most of the time. *Papilio machaon* was far from plentiful and difficult to catch in the wind, and I only succeeded in getting two specimens. Sugar and lamp produced hardly anything, and I returned thoroughly "fed up." On my return to Datchet in mid-September I found an almost complete dearth of late summer butterflies. *Pyrameis atalanta*, usually plentiful on the Michaelmas daisies and apple trees in my garden, was only represented by one specimen, and I did not see a single *Vanessa urticae*. *Polygonia c-album*, of which I took or saw quite a number last year, was also absent.

BUTTERFLIES IN DEPT. CHARENTE. FRANCE.

BY J. A. SIMES, O.B.E., F.E.S.

THE Department of Charente, S.W. France, does not appear to have been explored to any considerable extent by British lepidopterists, and it may therefore be of interest to chronicle the results of a short holiday there in June, 1931, in the company of Mr. A. C. Smith, F.E.S., and Mr. C. B. Smith, F.E.S.

Our interest in the Department was aroused by a paper in the *Entomologist*, xliv, p. 305, by the late H. Rowland Brown, who spent a day in the vicinity of Angoulême in June, 1910; and he, in his turn, was evidently induced to go there by the glowing account of the district given by the late Charles Oberthür in the preface to the *Études de Lepidoptérologie comparée*, fasc. iii.

The two chief attractions to us were *Agriades bellargus* ♀ f. *coelestis*, which was represented as of frequent occurrence throughout the region, and *Coenonympha oedipus*, which was said to be abundant enough in the marshes of the Forest of Livernant, close at hand. The first of these objects was duly attained, as the sequel will show; but the second was not, because the Forest of Livernant is not, as M. Oberthür appeared to suggest, in the vicinity of Angoulême at all. Mr. Rowland Brown was much exercised to locate the forest of Livernant, and from later information concluded that he had actually been within a mile of it. The forest to which he refers was clearly the Forest of Dirac; the Livernant Forest is far away in the Dordogne.

My friends and I left London on June 5th and arrived at Angoulême the same night. We found comfortable quarters at the "Nouvel Hotel et des Trois Piliers," and made that hotel our headquarters. Our collecting was done for the most part in the country to the south and south-east of the town—that is to say, on the limestone hills immediately outside Angoulême; at Puymoyen and the valley of the Eaux Claires; at Mouthiers and the valley of the Boême; towards La Roche Beaucourt, and in the forest belt to the south-east of Angoulême. *Agriades bellargus* was abundant everywhere on the limestone, and whenever it occurred a proportion of blue females was encountered. In some districts the proportion was low, perhaps not more than 2 or 3% of the females being blue; but in other areas, notably the rough limestone ridges lying between Angoulême and Puymoyen, the proportion was much higher, and in one morning my companions and myself took over fifty examples. On June 8th an example of the hybrid (?) *polonus* was taken flying with the *bellargus*, and a few days later an example of the ♀ f. *coelestis* with a nicely rayed underside.

Our first visit to the forest belt was on June 9th, when we went by car to a spot near Dirac. The insects encountered were mostly those one would expect to find at such a time and place. *Melitaea aurinia* was frequent, but past its best. *Pararge achine*, which was just emerging and very local, appeared to prefer those places in the woods where the Spanish chestnut grew. The best insect noted was *Heteropterus (Cyclopides) morpheus*, of which we saw one example but failed to capture it. Two days later we again visited this area, when we took three examples of *H. morpheus*, and a nice form of *Melitaea athalia* in some numbers. My friends had to leave for home on June 13th, and after their departure I set myself the task of exploring the eastern and south-eastern forest belt with the object of discovering the headquarters of the skipper *H. morpheus*, of which we had only obtained previously a few odd specimens. On June 15th I spent the whole day tramping the forest roads in several directions, picking up occasional specimens from time to time as I proceeded; but in the afternoon the numbers began to increase, and continued to do so as I pursued my way. The trail eventually led me to a glade running up into the forest between banks of scrub, with marshy spots here and there: and hereabouts was clearly the headquarters of the species. By 6 p.m. I had taken over forty specimens, and the insect was still flying when I left. On the following day I was on the ground again as early as possible; and in little more than two hours I had filled nearly a hundred boxes without moving more than a few yards. Further exploration in several directions showed a marked decrease in the numbers of the insect as I receded from this favoured spot; but although the numbers declined, the insect was found to be widespread throughout the region; and I even found it in a copse within a mile from Angoulême.

My last day was June 18th, and on that morning I saw the first male *Satyrus circe* and *S. semele*. It was surprising to find them at such an early date—before even *Aphantopus hyperantus* had appeared.

The region to the south of Angoulême is a delightful one. It is devoid of anything grandiose in the way of scenery, and for that reason does not attract the tourist—a fact which I am far from lamenting; but it is one of real beauty, with plenty of interest for the naturalist, and withal peaceful and restful. That handsome bird, the hoopoe, is frequent in the ploughed land and stubbles, and is often to be seen at close range. An occasional stork may be seen in the neighbourhood of the more remote villages and the kingfisher on the streams, while harriers and other hawks hunt the marshes and nest in holes in the limestone cliffs. Cuckoos were calling and nightingales singing up to the day of my departure for home,

while the joyous notes of serins and goldfinches everywhere helped to swell the chorus. Towards the end of our stay the cicada was added to the orchestra.

The following is a list of all the butterflies met with: *Papilio podalirius*, nearly over; *P. machaon*, frequent; *Colias hyale*; *C. edusa* and ♀ f. *helice*; *Gonepteryx rhamni*; *G. cleopatra*; *Euchloë cardamines*; *E. belia* var. *ausonia*; *Leptidea sinapis*; *Aporia crataegi*; *Pieris brassicae*; *P. rapae*; *Pontia daplidice*; *Chrysophanus phlaeas*; *C. dorilis*; *Callophrys rubi*, worn; *Thecla ilicis*, abundant (this and *C. rubi* were not much seen in the earlier part of the day, but about 5 p.m. they came down low in great numbers); *T. spini*, a few; *T. acaciae*, frequent; *Agriades bellargus* and ♀ f. *coelestis*; *A. hyb.* (?) *polonus*, one; *A. thersites*, rare; *Polyommatus hylas*, rare; *Lycaena icarus*; *L. escheri*; *Aricia astrarche*; *Cupido minima*; *Nomiades cyllarus*; *N. semiargus*; *Plebeius aegon*; *P. argus*; *Scolitantides orion*, one; *S. baton*; *Cyaniris argiolus*, a small race; *Nemeobius lucina*, nearly over; *Limenitis sibylla*; *L. camilla*; *Issoria latona*; *Argynnis aglaia*; *A. cydippe* (*adippe*); *Brenthis dia*; *B. daphne*; *B. selene*; *Melitaea aurinia*; *M. athalia*; *M. didyma*, a few; *M. phoebe*; *Pyrameis atalanta*; *P. cardui*; *Polygonia c-album*; *Aglais urticae*, rare; *Eugonia polychloros*, just emerging at end of period; *Pararge achine*, abundant; *P. maera*, many females of pronounced *adrasta* form; *P. aegeria*; *P. megera*; *Epinephele jurtina* (*janira*); *Coenonympha arcania*; *C. pamphilus*; *Satyrus circe*; *S. semele*; *Hesperia actaeon*; *H. sylvanus*; *H. lineola*; *Syrictus carthami*; *Nisoniades tages*; *Heteropterus* (*Cyclopides*) *morpheus*, abundant.

A total of 66 species in 13 days.

SCOPARIA ULMELLA KNAGGS IN DEVON.—Recently, when visiting Mr. H. S. Tuke at Colwell, near Houston, I looked over a number of "micros" which he had taken at light in his house. Among these I noticed a specimen of *Scoparia ulmella* Knaggs. Although this moth has been taken in some southern localities, I can find no Devon record of its capture in either Barrett or Meyrick, so Mr. Tuke's specimen appears to be a new county record.—H. C. HUGGINS; 5, Windsor Avenue, Cliftonville, Margate.

ECCENTRICITIES OF THE SEASON.—Mr. Stowell's notes on this on p. 70, in conjunction with Mr. James's remark about 1893 on the previous page, bring to my mind what will probably be the record eccentricity amongst lepidopteral annals for many years to come, viz. the occurrence of a specimen of *Taeniacampa stabilis* in fair condition on an oak trunk in the New Forest on May 20th, 1893; a freshly emerged *Limenitis sibylla* on the following day and also a perfect *Argynnis adippe*!—C. NICHOLSON; Tresillian, Cornwall.

HEMEROBIUS SIMULANS WALK.. *H. OROTYPUS*
WALLENGR. AND *H. CRISPUS* STEPH. WALK.
(NEUROPTERA).

By D. E. KIMMINS.

For some time past, Continental entomologists have been applying the name *Hemerobius simulans* Walker to the European insect known to British workers as *H. orotypus* Wallengr. McLachlan (1899) states that he could not find characters to separate *H. simulans* from *orotypus* but, because of the scarcity of nearctic material and the possibility that there might exist slight differences,

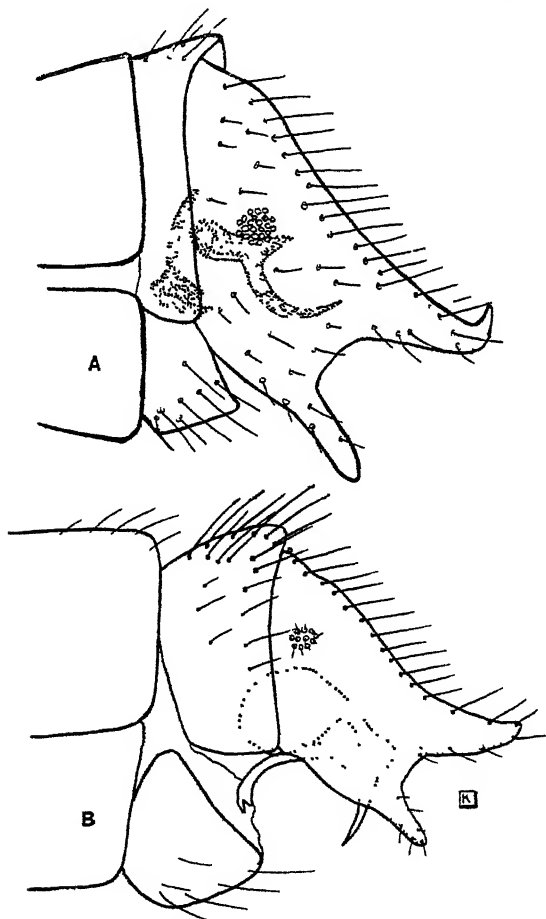


FIG. 1.—Male genitalia of *Hemerobius simulans* Walk., A, and of *Hemerobius* sp. (indet.), B.

he decided to retain the name *orotypus* for the European specimens. This appears to have given rise to a certain amount of confusion, as Banks (1905) writes of *H. simulans*, "McLachlan, who has seen the type in the British Museum, says it is the same as *H. orotypus*," . . .

It therefore seemed advisable to make a microscope preparation of the genitalia of Walker's type in order to compare it with examples of *H. orotypus*. The result of this examination leaves no doubt as to the synonymy of *H. simulans* (Fig. 1, A) and *H. orotypus*.

A similar examination of the specimens determined by Walker as *Hemerobius crispus* Stephens revealed the presence of two distinct species. The male labelled "Nova Scotia, Redman," is identical with *H. simulans* Walker, whilst the other male, from "N. America," is entirely different and belongs to the group of *stigma* Stephens. Several N. American species have already been described belonging to this group, and as I have not been able to examine sufficient material of these species, I am figuring the Walker specimen in the hope that American neuropterists may be able to settle the question of the synonymy of this species (Fig. 1, B).

The synonymy of *H. simulans* Walk. may therefore be cited :

Hemerobius simulans Walker, List Neuropterous Ins. Coll. Brit. Mus., Part II, p. 285, 1853.

= *Hemerobius crispus* Stephens Walker (*partim*), l.c., p. 288.

= *Hemerobius orotypus* Wallengren, Öfv. K. Svenska Vetenskap Akad. Förhandlingar, p. 155, 1870.

LITERATURE CITED.

(1899) McLACHLAN, R.—Notes on Certain Palaearctic Species of the Genus *Hemerobius*, No. 2, *Ent. Mo. Mag.*, xxxv, pp. 131-3.

(1905) BANKS, N.—A Revision of the Nearctic Hemerobiidae, *Trans. Amer. Ent. Soc.*, xxvii, p. 33.

('ALYMNIA DIFFINIS.—In the March *Entomologist* (lxv, p. 70, 1932) Mr. Russell James asks for hints on taking *Calymnia diffinis*, L. I have secured these moths fairly commonly at sugar in August near Faringdon, Berks, but augmented my catch by digging for pupae at the foot of large elms (*Ulmus campestris*). The cocoons are very slight in texture, and the plum-bloomed pupae are easily damaged unless very carefully manipulated. By digging at the foot of the trees the cocoons are found between the sod removed and the trunk, more often attached to the bark of the tree than the sod. The cocoons are of loosely woven silk, and have intermixed with them small particles of earth, dry grass and minute twigs. They are hard to detect, and are secured more by the feel of the fingers than by eyesight. Several were taken at the end of July. The specimens in my series are very dark coloured, being the bright purplish-red form corresponding to Hübner's var. *affinis*, which is the commonest form occurring in Britain according to Tutt (*Noctuae*, iii, p. 21). I do not get this *Calymnia* in this part of the Cotswolds, but have seen a few specimens in Dr. O. H. Wild's collection taken near Cheltenham.—C. DONOVAN, Lt.-Col. I.M.S. (retired); Bourton-on-the-Water, Glos., March 4th, 1932.

A SYNOPSIS OF THE BRITISH HYMENOPTEROUS
FAMILY CYNIPIDÆ.

BY CLAUDE MORLEY, F.E.S., F.Z.S.

(Continued from p. 65).

That *F. consobrinus*, Gir., is distinct from *F. scutellaris*, Rossi, rests upon the very doubtful constancy of the above characters, the more compact apical joint of its flagellum, which is infusate or piceous below, and the unstriolate base of the abdomen: it has not occurred with us outside Scotland, though *F. scutellata* is known both there and in the London district; on the Continent the latter has been reared from puparia of the Tachinid Dipteron, "*Sarcophaga striata*"; it occurs on Clare Island (*Proc. R. Irish Acad.*, 1911, xxiv, p. 18), and is by no means rare in southern England; in Herts (Piffard) and Suffolk, where I have often found it upon the umbelliferous flowers of *Cicuta virosa*, *Heracleum*, *Angelica* carrot and fennel from June 28th to September 20th at Oulton, Marlesford, Henham, Benacre, and in my paddock at Monks Soham. Also from Herts, Piffard has given me several *F. anthomyiarum*, which Bouché bred in France from the Anthomyid Diptera, *Hydrotæa dentipes*, Fab., and *Anthomyia floralis*, etc. The sole record of *F. nitens* in Britain in 1890 was from Ayrshire, but I once met with it on September 17th, 1912, at Reydon near Southwold; and *F. urticarum*, whose slight characters preclude generic distinction, is found in Lanark.

Genus vi: LONCHIDIA, Thoms.

Öfv. 1862, p. 413

This distinct genus is instantly recognized by the single large and deep subcircular fovea at the mesonotal base. I have both the apparently uncommon species in Piffard's Hertfordshire collection from Felken. The infumate nervures and conspicuous oblong spot in the radial cell, besides its distinctly punctured scutellum and more pilose metathorax, render *L. maculipennis*, Dahlb. (*Onych.*, pl. iii, 1842, p. 1), which is recorded with us solely from "Lamport (T. A. Marshall)"—doubtless a misreading for Lavingham in Yorks—distinct from the perhaps less rare *L. clavicornis*, Thoms., already found at Worcester, about London and in Lanark. Economy unknown to me.

Genus vii: ANOLYTUS, Först.

No one had taken the single species of this genus in 1890 but Marshall, and his material likely came from southern England. As I understand it, *A. rufipes*, Först., is a far more squat insect than its figure (*Phyt. Hym.*, iii, pl. vii) leads one to suppose; much more

closely resembling a small *Synergus*, from which it differs in the fine mesonotal longitudinal aciculation and, in the present group also, by its lack of fovea before the scutellum. Though instancing neither, Cameron presumably knew both sexes: however, a solitary ♂ found among Thrips in an Oxlip flower at Newport in Essex on April 28th, 1914 (C. Nicholson), has the scape infusate and flagellum abruptly clear flavous throughout, with the latter's basal joint strongly curved, while a ♀, sitting on a lime leaf (with a similar ♂ on May 24th, 1908) in my Monks Soham garden on June 21st, 1919, has the simple and filiform antennae dark throughout and both head and thorax a good deal more nitidulous: both are but $1\frac{1}{2}$ mm. in length, for this is our smallest of the Figitides.

Genus viii: AMBLYNOTUS, Htg.

Table of Species.

- | | |
|--|-------------------------|
| (1) 1. Notauli deep and entire; ♀ first and second flagellar joints of equal length. | |
| (3) 2. Scutellum stronger punctate, with larger basal fovea | 1. <i>opacus</i> . |
| (2) 3. Scutellum finer punctate, with smaller basal fovea | 2. <i>femoralis</i> . |
| (1) 4. Notauli indicated only at base; first flagellar joint longer | 3. <i>longitarsis</i> . |

Here should be treated, perhaps even inserted, *Zygosis heteroptera*, Htg., *Zeit. Ent.*, 1843, p. 403, and *Trischiza aphidivora*, Cam., *Mem. Manch. Phil. Soc.*, 1889, p. 67, but both are unknown to me.

A. opacus, Htg., is recorded from France, Austria, Germany, Sweden, and as of wide distribution in Britain. I have examples from the Kola Peninsula in Russian Lapland, taken on August 14th, 1917 (Cockayne), Cornwall (May 8th, Thornley), and have myself found the species at Dalkey near Dublin, Ringwood in Hants, Mablethorpe in Lincs, as well as at Tuddenham Fen and Brandon in Suffolk from May 27th to July 2nd only. The Scots *A. femoralis*, Cam., has been found in Notts (Carr, 1916), Herts (Piffard) and Hants, at Norton Wood in I. of Wight on June 20th, 1907. Though hitherto considered rare and unlocalized as British, Mr. E. A. Elliott and I beat both sexes of *A. longitarsis*, Reinh., in some numbers from pine trees at Barton Mills in Suffolk on June 5th, 1916, along with a ♀ *opacus*, which fact calls their specific distinction into some question; the latter is named as the species bred by Giraud in France from pine-feeding "Insectes," doubtless dipterous.

Genus ix: SAROTHRUS, Htg.

Conspecific as our two kinds obviously are from the ♂ characters, which so closely resemble those of *Figitex* that I can distinguish

them with certainty by no feature but lack of ocular pilosity, the ♀♀ of *S. areolatus*, Htg., differ from all our other species of this tribe in their peculiarly compressed and cultriform abdomen, always more or less rufescent and usually having the terebra elongately exerted. Both sexes are distinct from *S. tibialis* in the entire areolet, infumate wings and structure of notauli, which extend at most to the middle of mesonotal disc, often but shortly from mesonotal base. Cameron knew it as indigenous solely from Norwich (Bridgman): but actually this is among our commonest British insects, and the sexes occur annually in great numbers on the flower-heads of *Daucus carota* and *Heracleum sphondylium* in my Monks Soham paddock in Suffolk and at Cromer in Norfolk during but July 20th to August 29th. From autumn-sown lettuces Mr. B. S. Harwood bred at Sudbury in Suffolk and Colchester in Essex both the Anthomyid Dipteron *Phorbia lactucae*, Bouché, and its parasite, *S. areolatus*; both remain in the former's puparia during the winter and emerge the following June, when the latter frequent flower-heads of lettuce during that and the next month (*Ent. Mo. Mag.*, 1919, p. 280). Our other species, *S. tibialis*, Zett., *Ins. Lap.* i, 1838, p. 499 (= *caviliculatus*, Htg., *Germ. Zeit.*, ii, p. 203), is no rarer and certainly more widely met with, occurring from June 11th to 29th and apparently distinctly from August 26th to November. Bucarest (*ex coll.* Montandon), Hants (Godshill in I. of Wight), Lincs (Louth and Market Rasen in June, 1912), Sussex at Hastings Castle (Elliott), Wilts (♂♀ in Groveley Wood on June 27th, 1911), and in Suffolk at Henstead, Henham, Wangford (on *Artemisia*, along with the above Synergi), Monks Soham *in cop.* on *Angelica* and *Heracleum* flowers, and one evidently newly-emerged ♂ as early as May 21st, 1921, at Thorp by Debenham.

Genus x: MELANIPS, Walk.

Ent. Mag., 1836, p. 161.

Our single small and elongate *M. urticeti*, Dahlb., with acute anus, has the facies of the Proctotrypid genus *Diapria*; and doubtless Cameron a good deal over-estimated its frequency when terming it commonly distributed in both England and Scotland, for the ♀ alone has occurred to me very sparingly and then in quite late autumn, after the average entomologist has ceased to collect. Several at Felden in Herts (Piffard); two swept from thistles on November 16th, 1895, at Bentley Woods in Suffolk, where it was not again seen till one turned up on October 22nd, 1922, walking on a window of Monks Soham House.

(To be continued)

NOTES AND OBSERVATIONS.

PARANEUROPTERA IN 1931.—On May 4th I saw my first *Pyrhosoma nymphula*, Sulz., at a small pond near St. Leonards-on-Sea; though with yellow stripes on the thorax, these were strong on the wing. At the same pool, on May 10th, a female *Brachytron pratense*, Müll., just emerged, was clinging to a bur-reed; it was still there next day. On May 13th *Agrion puella*, Linn. (a female with large basal spots on the segments), and *Libellula depressa*, Linn., were seen, with many *P. nymphula*: and on May 14th a single *Ischnura elegans*, Lind., with a typical female of *A. puella*—all in St. Leonards district. A single female of *Calopteryx virgo*, Linn., at Crowhurst, May 18th, is my last note in SUSSEX.

The following records refer to Surrey, mostly Richmond Park and the Weybridge to Woking district. First appearances noted were: *Cordulia aenea*, Linn., Godalming district, May 21st, and three, Byfleet, May 23rd: *Enallagma cyathigerum*, Charp., one, Godalming district, May 21st, and one, Richmond Park, May 22nd; *Calopteryx splendens*, Harr., two, May 22nd, and *I. elegans*, two, May 22nd (both species in swarms, May 26th); *Libellula quadrimaculata*, Linn., one, May 25th, and *Erythromma naras*, Hans., female, May 25th.

Ischnura pumilio, Charp., May 26th. I believe this has not been recorded from Surrey before; on the above date I took a nice var. *aurantiaca* which at the time was supposed to be a small *I. elegans* var. *infuscans*; the wholly bronze abdomen suggested the rarer species, and a lens examination of the prothorax settled its identity practically. I next met with the species on June 13th, when I captured a male, and saw a few others (in view of the fact that I had earlier caught an imperfect individual which I now find is only *I. elegans*, I cannot feel positive of more than two or three). The haunt in question is extremely circumscribed, and I judge its continued occurrence there to be very doubtful; I saw but one or two typical females (June 23rd), and by the end of the month it seemed to have vanished. I know nothing of the variation of this species, but one shows much larger marks on the 9th segment than appear in Mr. Lucas's figured specimens. In my cabinet specimen (of which I regret that I did not make observations while it was alive), the 9th segment appears now wholly dark except for a moderate-sized almost round blue spot on each side, about two-thirds the length of the segment from base; while the 8th has but a very narrow blue apex. The description of the pterostigma "quasi rotundato" is very appropriate in my specimen (very unlike that of *elegans*), but this is less marked in the two females I possess.

Platynemis pennipes, Pall., two teneral males, June 3rd. By this date *Agrion pulchellum*, Lind., was fairly common, and had evidently been out some time. On June 12th, in the Godalming district the first male *Cordulegaster annulatus*, Latr., was seen (this was minus a wing, perhaps the work of a hobby); later I found another, and saw in the distance a huge dragonfly which was probably a female. The next day I saw my first *Anax imperator*, Leach, but as

on June 14th I counted no less than sixty-five empty naiad skins (besides two freshly-emerged imagines) round one smallish pond in Richmond Park, it was probably out before this. After this, most species seemed to me later on the wing than last year. *Somatochlora metallica*, Lind., was not certainly seen till June 23rd; while a long day on the common near Godalming on June 26th resulted in finding only single examples (males) of *Orithetrum coerulescens*, Fabr., and *Pyrhosoma tenellum*, Vill., though *Lestes sponsa*, Hans., was out in fair numbers (none with blue colouring, however).

A visit to the North from July 8th to 17th may account for my not seeing *Aeschna grandis*, Linn., before July 19th, when I found an empty naiad case, and an imago in the act of emerging in Richmond Park. Of *Sympetrum scoticum*, Don., many teneral males on Godalming district commons, on July 22nd. An immature *Sympetrum striolatum*, Charp., was seen near Woking, July 24th. Though *Aeschna juncea*, Linn., was possibly seen near Godalming on July 22nd, it was not certainly recorded till August 7th, on which date the heath there literally swarmed with *S. scoticum* and *L. sponsa*. *Aeschna mixta*, Latr., was also first seen on August 7th and next day at Hastings, in which neighbourhood it was not uncommon throughout August and September. *Aeschna cyanea*, Müll., was first seen at Byfleet, July 29th. Single females of *Sympetrum sanguineum*, Müll., were seen near Hastings, September 21st and October 7th.

Some latest dates were *A. imperator*, at Byfleet, August 3rd; in Hastings district—*E. cyathigerum*, September 6th; *L. sponsa*, September 13th; *I. elegans*, September 22nd; *Ae. grandis*, October 14th; *Ae. mixta*, October 19th; *Ae. cyanea*, October 24th; *S. striolatum*, October 27th.—H. G. ATTLEE.

RECENT LITERATURE.

Stylops: A Journal of Taxonomic Entomology.

Part 1 [Why not No. 1?] of this new periodical, to be published monthly by the Entomological Society of London, contains brief systematic papers by six authors, the subject-matter of which ranges over five Orders. One article concerns Lepidoptera—Syrian Lycaenidae, contributed by Capt. Hemming—and the others deal with Coleoptera, Diptera, Hymenoptera and Hemiptera. The "make-up" is good; the size of the page is 10½ in. by 7 in. Contributors need not be Fellows of the Society, but will have to bear the cost of plates in any case, though not of line-blocks; the annual subscription is 24s. (16s. to Fellows). Some criticism has been levelled at the Society for starting another entomological journal in this country. For our own part, we welcome the journal, and congratulate the Society on its far-sightedness in providing this outlet for the short, purely systematic papers for which it is so difficult as a rule to obtain publication without enormous delay. Subscribers to the three old-established magazines do not, we know from experience, welcome this class of matter; *Stylops*, we hope, will relieve

them of a good deal of it. to their advantage. There will certainly be no lack of "copy" for the new journal, and we trust no lack of subscribers to help it on its way. It is a pity, perhaps, though quite natural, that more generous assistance cannot at present be promised in the matter of illustration. Good figures are frequently better than any amount of descriptive text, and the cost of providing them is still a serious consideration with most authors. We hope, however, that even if authors do provide them, not all the plates will, like Plate I, lack the clues to their explanations!

The Identification of Indian Butterflies. By Brigadier W. H. EVANS, C.S.I., C.I.E., D.S.O., F.R.G.S., F.Z.S., F.E.S. Second edition. Pp. x + 451, 32 plates. The Bombay Natural History Society.

The first edition of Brigadier Evans's book, itself a re-issue of his "keys," was noticed in the *Entomologist*, lxi, p. 93, 1928. This revised edition is much more imposing, the text having been entirely re-set in larger and better type. Considerable revision of the matter is also evident, but, in view of the highly condensed nature of the text, needs very careful looking for, as it is of necessity a matter of detail. Many new names are introduced for local races not recognized in the earlier edition, and the introductory matter has been re-written, expanded, and greatly improved. The greatest alteration has been made in the treatment of the *Hesperiidae*, the keys to which have been completely revised, and from which the Australian species, formerly included, have now been withdrawn, thus reducing the genera dealt with to 99. This is undoubtedly the most valuable contribution to the study of the family since the publication of Elwes and Edwards's *Oriental Hesperidae*. For further details our earlier notice should be consulted.

Revista Soc. Ent. Argentina.

Volume IV of this publication contains an admirable account of the whole of the *Nymphalidae* known to occur in Argentina. It is contributed by Capt. K. J. HAYWARD, occupies 200 pages of text and is illustrated with 21 black-and-white plates. The treatment is systematic and very comprehensive. Although keys are not given for the separation of genera and species, both are very well characterized, and the venation is illustrated in the case of all the principal genera. It is surprising to find how much is known of the early stages of these S. American *Nymphalids*; there is relatively far more information available than in the case of the African members of the same family. The racial and individual variations of every species in which they have been recognized are dealt with at length, and several new subspecies and varieties are described. Such a monographic treatment of this group should do much to encourage Argentine lepidopterists, for it lays well a foundation upon which the author may justly be congratulated, and upon which others may build in the future.

British Museum (Natural History).

Fascicle 7 of Part VI of the *Insects of Samoa* was published in November, 1931. It is by J. R. MALLOCH, and in fourteen pages deals with the eight species of Trypetidae, four of which are new, found in Samoa. The cover of this part bears a formidable and gratifying list of the fascicles already published. Could not some indication now be added as to the number still to be issued, or a note given as to whether any parts are complete? It is rather a puzzle at present to discover what may still be in store. Part VII, fascicle 4, was issued on February 27th, and consists of an account of the Psocoptera by H. H. KARNY.—N. D. R.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Annual Meeting, Wednesday, January 20th, 1932.*—Dr. H. Eltringham, F.R.S., President, in the Chair.—The Secretary, Dr. S. A. Neave, announced that the Fellows nominated as Officers and Council for the ensuing year had been duly elected. He then read the Report of the Council, which was adopted on the motion of Mr. H. J. Turner, seconded by Mr. E. B. Ashby.—The Treasurer, Capt. A. F. Hemming, C.B.E., read his Report, and this, together with the accounts for the year, was adopted on the motion of Mr. H. Willoughby-Ellis, seconded by Mr. R. W. Lloyd.—The President read his address, after which a vote of thanks to him, coupled with the request that the address might be published in the *Proceedings*, was moved by Prof. E. B. Poulton, F.R.S., seconded by Mr. G. Talbot, and carried unanimously.—A vote of thanks to the Officers for their services was passed on the motion of Dr. G. D. Hale Carpenter, seconded by Mr. N. D. Riley, and carried unanimously. Dr. S. A. Neave and Capt. A. F. Hemming briefly replied.

Wednesday, February 3rd, 1932.—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Vice-Presidents.*—The President announced that he had nominated Sir Thomas Hudson Beare, B.Sc., F.R.S.E., Mr. R. W. Lloyd, and Sir Guy A. K. Marshall, C.M.G., D.Sc., F.R.S., as Vice-Presidents for the year.—*Election of Fellows.*—Lt.-Col. C. G. Nurse, of Redcote, Rusthall Park, Tunbridge Wells, was elected a Special Life Fellow, and Mr. W. K. Ford, of the Citrus Experimental Station, Mazoe, Southern Rhodesia, was elected an Ordinary Fellow of the Society.—*Exhibits.*—Mr. W. J. Kaye exhibited some Jamaican butterflies, and corrected an error in a statement made at a previous meeting. Mr. Hugh Main exhibited and made remarks on a millipede's "tent." Dr. P. A. Buxton gave an account of some ancient workings of insects, perhaps bees, from Megiddo, Palestine. Mr. O. W. Richards exhibited and made remarks on (1) *Vespa adulterinus* (Buysson), a cuckoo-wasp, (2) a new species of *Microstigmus* (Hym. Sphecoidea) and its nest, (3) *Leptofoenus peleciniiformis*, Smith, a synthetic Hymenopteron. Dr. G. D. Hale Carpenter gave an account of (1) *Acraea johnstoni*, its forms and their geographical distribution, (2) *Acraea stenobea* reviewed, and *A. lygus* separated. Prof. E. B. Poulton, F.R.S., made remarks on

(1) the geographical races of *Charaxes ansorgei* Roths. and of *Planema epaea* (ramer, (2) the capture of insect prey by Reduviid bugs of the genus *Amulius*, etc., (3) changes in the methods of insect protection at successive periods of growth observed in an Indian Coreid bug, by Major R. W. G. Hingston, M.C. Mr. H. E. Andrewes exhibited and gave an account of two new genera of Coleoptera from the Himalayas.—S. A. NEAVE, *Hon. Sec.*

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at "Durandesthorpe," 19, Hazelwell Road, Putney, on December 17th, 1931, Mr. H. Donisthorpe in the Chair, the other members present being Messrs. Robert Adkin, H. Willoughby-Ellis, Jas. E. Collin, W. J. Kaye and Dr. Harry Eltringham; and the visitors: Sir T. Hudson Beare, Mr. E. C. Bedwell, Mr. K. G. Blair, Capt. A. F. Hemming, Dr. Karl Jordan, Mr. G. C. Leman, Mr. Martin E. Moseley, Mr. Wm. G. Nelson, Capt. N. D. Riley and Mr. W. H. T. Tams. The meeting was called for 6.30 p.m. On arrival the members and guests were received by Mr. and Mrs. Donisthorpe, when light refreshments were dispensed in the drawing-room. The Chairman's collections were on view, and he specially exhibited two live ant colonies and his collection of British Coleoptera. The Windsor Pilot Files, compiled by the Chairman, recording a very large number of interesting insects, which, during many years, he has collected at Windsor Forest, created much interest. Supper was served at 8 o'clock, and the very enjoyable meeting was continued to a late hour.—H. W.-E.

OBITUARY.

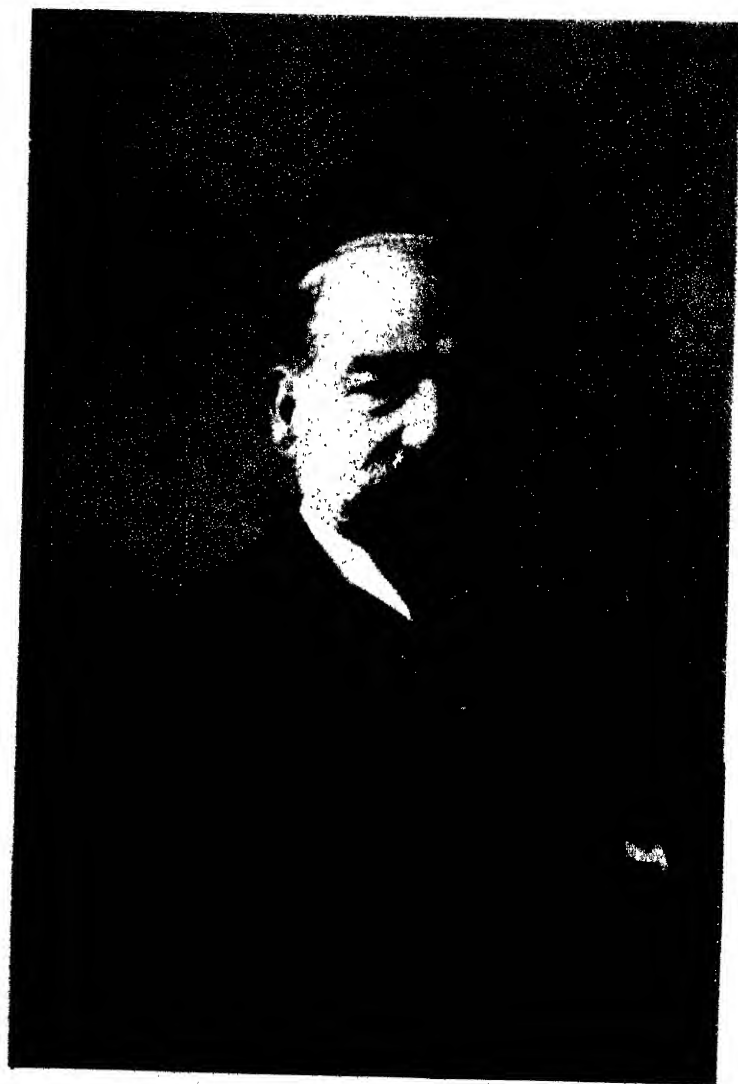
WALTER RANDALL PARKES.

At the early age of 27 Walter Randall Parkes passed away on February 11th from pneumonia, after a very short illness. After graduating from Emmanuel College, Cambridge, in 1928, he proceeded to St. Thomas's Hospital, where he recently qualified in medicine and surgery and had just been appointed to a responsible position. Besides entomology, his chief hobby was rifle-shooting, at which he soon made his mark, and captained the Cambridge small-bore team for the Heslop Cup in 1928.

In the field he was an ardent and sharp observer and spared no effort to unearth new facts and localities. In this direction both the writer and many others will always remain indebted to him for much pioneer work and information. Though Lepidoptera were his chief outdoor pursuit, he devoted his attention also to the study of Orthoptera, and contributed several interesting notes on both groups to this journal. All who knew him greatly deplore that he should have been cut off at the outset of such a promising career, and they deeply feel the loss, not only of a keen student of nature, but also of a very good friend.

C. DE W.

WE very deeply regret to have to record the death, on March 28th, of Mr. Richard South, who for so many years edited this magazine.—ED.



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RICHARD SOUTH.

THE ENTOMOLOGIST.

VOL. LXV.]

MAY, 1932

[No 828

RICHARD SOUTH.

b. July 19th, 1846, d. March 28th, 1932.

(Plate III.)

THE death of our late editor, Mr. South, was briefly recorded in our April issue (p. 96). It was not altogether unexpected, for he had been in failing health for a year or two. Yet the severance of a friendship of long standing, and of a connection with this magazine extending over more than half a century, comes none the less as a shock.

Richard South, the son of Richard and Emma South (*née* Moore) was born at Cochrane Terrace, Marylebone, in the year 1846, and thus would be 85 years of age at the time of his death. His forbears appear to have come to London from the Isle of Ely, where the family had long been established, and to have been connected with an old Huguenot family of the name of Flanders. He is said to have been a descendant of the celebrated divine, Dr. Robert South (1634-1716), who at one time was chaplain to James, Duke of York. Little is known of Mr. South's early life beyond the fact that he was educated at a private school at Reading. He early married his cousin, Sarah South, but both she and their only child, Lucy Elizabeth, predeceased him, in 1901 and 1913 respectively. In 1914 he married Evelyn, eldest daughter of the late William Urquhart, a former mayor of Paddington and member of the London County Council.

It was not until he was nearly thirty that Mr. South commenced to contribute to the entomological magazines. His first notes concern the occurrence of *Limenitis sibylla*, *Colias croceus*, *Sphinx convolvuli*, etc., at Goldbeater's Farm, Mill Hill, Hendon, and appeared in the *Entomologist* in 1874 and 1875. From then onwards he became a more and more frequent contributor, showing a wide knowledge of his subject, and by the time he was appointed Editor, already over fifty short notes and longer articles from his pen had appeared. A few also were published in the *Ent. Mo. Mag.* between 1878 and 1887. He showed a predilection for the Pyralidae, Tortricidae and Pterophoridae, and most of his notes are concerned with these groups. His marvellous aptitude for naming Tortricidae in the field has been remarked by many who collected with him. The Plumes in particular interested him, and his contributions

to the history of the British Pterophori, published in this magazine at intervals between 1881 and 1889, together with other notes on the same subject, contained much useful matter. His notes on the genus *Lycaena*, also to be found in the *Entomologist* (1887), in which the variation of a number of species was discussed in some detail, led him into a somewhat acrimonious discussion, principally owing to his rather unorthodox views upon the species-concept, and in particular caused him to fall foul of the late J. W. Tutt, with whom he very seldom could see eye to eye, and with whose temperament his own was fundamentally incompatible. A little earlier than this (1884) he had made his first serious efforts in systematic entomology, for his *Synonymic List*, published in 1884 under the aegis of this magazine, was an extremely useful piece of work. Although it called down the wrath of all and sundry upon his shoulders, it stood the test of time, being based upon priority of nomenclature, and marked a decided advance.

About 1887 South became associated with the late John Henry Leech, who had just published his *British Pyralides*, to which South had himself contributed several notes. Leech's interest in the Lepidoptera extended far beyond the British Isles. South, as a consequence, soon became a recognized authority on the butterflies of the Far East. He it was who did most of the spade-work of Leech's *Butterflies of China, Japan and Korea* (1892-94), and "devilled-up" most of the numerous descriptions of new far eastern Lepidoptera which flooded the *Entomologist* (and caused Leech to acquire that magazine) about 1890 and onwards. His association with Leech was only severed by the death of the latter in 1900, and South rendered him a last service by preparing the catalogue of the collection (which was left to the Nation) that was subsequently published by the British Museum (Nat. Hist.). His interest in the butterflies of China and Japan did not cease with the death of Leech; he became later associated with A. E. Wileman, with whom he co-operated in the publication of many systematic papers throughout a period which only terminated after the war. One of his last systematic papers dealt with the Sino-Tibetan region, being an account of the Rhopalocera obtained in S.-E. Tibet and the Mishmi Hills by Colonel (then Capt.) F. M. Bailey (*Journ. Bombay N.H. Soc.*). During this period South came much under the influence of Sir George Hampson, and published a number of short papers in the *Entomologist* for the purpose of correlating Hampson's systematic ideas with the generally accepted classification and nomenclature of the British Lepidoptera.

Throughout his long association with the *Entomologist*, which may be said to have first taken definite shape when he joined the Editorial Committee in March, 1886, and to have been consolidated

when he became Editor in 1890, he was a constant and regular contributor as well as Editor. An average of about twenty items each year came from his pen, apart from those others which appeared by virtue of his duties as Editor, such as reviews of books, obituary notices, etc. He endeavoured always to maintain as wide a range of interest as possible, and to exclude nothing of value. This policy appears often to have caused a certain amount of friction with his subscribers, especially those whose interests were particularly specialized, but that South's policy was the right one there can be no shadow of doubt; the magazine should keep in touch with all aspects of its subject, its only bias, if any, being in the direction of the study of British insects from all points of view. A special feature of South's own contributions to this magazine was his keen interest in variation, either geographical or individual, the latter type being illustrated in most cases by plates or text-figures; he compiled a list of the aberrations figured in the *Entomologist*, and this will be found published with the Special Index for 1900. His records of captures, etc., are extremely numerous, his faunistic papers, on N. Devon (1881, etc.), the Outer Hebrides, Shetland and Orkneys (1888), the Isle of Lewis (1901), etc., less frequent, but his writings cover such a wide range of subject, and are so many, that no attempt unfortunately can here be made to analyse them. With the onset of the Great War his contributions gradually became less and less regular. The war affected him seriously in more ways than one: lack of contributors, loss of subscribers, greatly increased costs of publication and various financial difficulties all adversely influenced the magazine. After the war he seemed to have lost interest to some extent in the magazine; he was no longer able to get about to the meetings of societies, to the Museum, or out into the country as formerly, and we believe that it was a great relief to him to hand over to us in 1924 the responsibilities in connection with the magazine which he had so long and ably borne. He parted with his second collection in 1924 to Mr. Bethune Baker, who subsequently presented it, except for the Tortricidae, which are at S. Kensington, to the City of Birmingham (his earlier collection he disposed of in 1898), and thereafter he turned to the "other Orders"; and it is not without interest that his very last contribution to our pages (1926, p. 302) concerns his captures of Coleoptera in the New Forest.

Wide as the circle of entomologists must be to whom Mr. South has principally become known through his editorship of this magazine, wider still must be that which has been reached by his *British Butterflies* and *British Moths*, which appeared as three volumes, one in each of the years 1906, 1907 and 1908, and achieved instant popularity. They have remained by far the best thing of their

kind ever produced. The text is brief but to the point—it might almost be likened to a compressed edition of Barrett (of which South saw the last volume and a half through the press) and contains all the essentials: and the illustrations are so good that they absolved the author from the necessity of filling his books with purely descriptive matter. They have proved admirable for the beginner, for whom they were intended, and a godsend for the more advanced student. By these alone he has achieved the lasting thanks and remembrance of British Lepidopterists.

South was elected a Fellow of the Entomological Society of London in 1885, and served on the Council in 1890 and 1891. Of the South London Entomological and Natural History Society he became a member in 1882, served on the Council many times, and was twice President, in 1885 and 1896. Of that older and more exclusive body, the Entomological Club, some account of whose history and activity he published in the *Entomologist* in 1899 and 1909, he was appointed Secretary in 1891, re-appointed in 1897, and served till 1923. After the termination of his collaboration with Leech, he was employed by the Trustees of the British Museum (Natural History) as a special assistant, and undertook at different times the arrangement of the British collection, and of the Lycaenidae and Hesperidae of the world.

The writer, as a small boy of nine, had the great good fortune to find himself living next door to Mr. South, and he will never forget the quiet, unfailing patience with which all his innumerable questions were answered, often many times a day, and the care with which his earliest captures, frequently almost unrecognizable on account of their rough handling, were identified. Later, we fear, he often spent time which should have been devoted to study to discussing entomological matters in Mr. South's "den." One of the writer's greatest treats at this time was to be invited by Mr. South for a day's collecting. In this way he learned to appreciate his courtly and altogether delightful character, to catch some of his enthusiasm for his "bugs," and to honour him as a staunch personal friend. Most of his contemporaries have already passed over, and of late years he had rather dropped out of entomological activities, but to those who have long known him in any way, his death seems like another milestone—the end of another chapter.—N. D. R.

EARLY APPEARANCE OF ODONOPTERA BIDENTATA.—It may be of interest to record the occurrence of a freshly-emerged male *O. bidentata*, which I found at rest on March 27th last in my garden at Sutton, Surrey.—F. W. FROHAWK.

ON A NATURAL HYBRID BETWEEN *OPORINIA*
AUTUMNATA ♂ AND *O. DILUTATA* ♀.

BY J. W. HESLOP HARRISON, D.Sc., F.R.S.

FOR a period of nearly ten years, owing to the amount of time taken up by my genetical researches on melanism, the work in connection with the *Oporiniæ* (*Oporabiæ*) has been allowed, except for certain casual efforts, to lapse. However, a year or two ago, the discovery of a new colony of *O. autumnata* on Prestwick Car, Northumberland, in which many strange variations occurred, has renewed my interest in the genus, its species and its local races. Many collections, therefore, have been made in various stations in the two North-Eastern counties. Whilst the bulk of these collections has revealed the presence of only one species in any given wood, occasionally some woods have produced two, the two generally being *O. autumnata* and *O. dilutata*, but sometimes, as in Long Acre Dene Wood, the pair represented has been *O. christyi* and *O. dilutata*.

Naturally enough, the occurrence of pairs of allied species in such close proximity has caused me to keep a sharp look-out for possible wild hybrids, but no success attended my efforts until the present year, when, very curiously, I visited two distinct woods in which all three species, *O. autumnata*, *O. dilutata* and *O. christyi*, were to be found. In one of these, the wood along the Devil's Water, whilst the habitats of the two latter were hopelessly intermingled, the other species was attached, for the most part, to patches of birch or to alders along the stream side. On the contrary, in the second, Styford Wood in Northumberland, *O. autumnata* larvae were beaten from isolated birches and alders, and even hazel, scattered throughout the damp oak wood, the other two species falling from oak alone.

From the oak-feeding larvae was bred an extremely interesting male which, at first sight, was regarded as a large, curiously marked specimen of *O. christyi*. In spite of this determination, I speedily began to waver as to its real identity, for it agreed neither with genuine *O. christyi* from the Devil's Water nor with Styford representatives of the same species; hence I determined to prepare its genitalia.

Immediately this was done only one conclusion seemed possible—that it was a hybrid between *O. dilutata* and *O. autumnata*. Further, in that case, as the larva from which it was reared had been taken from oak, it could only have the parentage *O. autumnata* ♂ × *O.*

dilutata ♀: in mixed woods rarely, if ever, does *O. autumnata* oviposit on oak. In fact, I have never beaten *autumnata* from *Quercus*, although I have had it from birch, alder, hazel, willow, honeysuckle, larch and Scots pine.

Without delay, therefore, to clinch the matter, I compared my insect with specimens of the cross artificially produced by mating Dipton Wood (Northumberland) *O. autumnata* ♂♂ with *O. dilutata* ♀♀ from Shull (Durham); with these it agreed in every essential detail.

In ground-colour, like them, it was of a pale grey, with a "band formula" suggestive on a cursory inspection of *O. dilutata*. As a result, had anyone unacquainted with *O. christyi* captured it wild, they would, unhesitatingly, have assigned it to *O. dilutata*. Nevertheless, a critical examination of the banding would have disclosed the fact that the elbowed line was almost as perfectly right-angled as in *O. autumnata*, and furthermore, that, in its passage across the wing, it did not approach the discoidal point, these being the features which had caused me to look upon it as *O. christyi*, for in these respects *O. christyi* recedes from *O. dilutata* toward *O. autumnata*.

The genitalia, however, were absolutely decisive. In the first place, the octavals were much too far apart for the insect to be *christyi*, or any hybrid in the production of which that species had taken part, and, again, in the slight hook* on the valves, in the width of the labial head, and in the distance between the octavals there was complete agreement with preparations made from my experimental *autumnata* ♂ × *dilutata* ♀ hybrids. Thus, without any loophole for error, the moth has been proved to have the parentage just stated.

As an outcome of this capture, in view of Lotsy's work on *Evolution by Means of Hybridisation* (The Hague, 1916), some thought was directed to determine whether such naturally occurring hybridization could have been at work in the evolution of the species of the genus *Oporinia*. It can be asserted with complete confidence that the whole of the experimental evidence is against the possibility. Never in all of the extensive series of experiments in which *autumnata* ♂♂ were crossed with *dilutata* ♀♀ have genuine hybrid females been bred. Moreover, although the hybrid males are fairly fertile, the back-crosses with the two parent species have never yielded adult progeny. In addition, no support is to be obtained from a cytological examination of the gonads of the hybrid pupae. No reduction division takes place in either of the

* A warning must be given here that, although generally the valves in the ♂♂ of *O. autumnata* and *O. filigrammaria* are as figured in Pierce's valuable work, in certain undoubted specimens of both insects slight hooking of the valves is to be found.

two reciprocal *autumnata-dilutata* hybrids, so that their gametes are endowed with a complement of $31 + 38 (= 69)$ chromosomes. In that case, as experiment has confirmed, the back-cross with *dilutata* would have a somatic chromosome complement of $69 + 31 (= 100)$, and with *autumnata* $69 + 38 (= 107)$ —numbers quite unknown to the genus.

Even granting the production of such back-cross zygotes and their reaching the imaginal state, their cytological behaviour is such as to eliminate them from the discussion; it is of a hopelessly unusual type.

Since the circumstances in parallel hybrids involving *O. christyi* and *O. filigrammaria* are exactly the same, it seems certain that we must search elsewhere than in hybridity for evolutionary movement in the genus *Oporinia*,* at least so far as the hybrids discussed are concerned.

EARLY LEPIDOPTERA DATES, 1931-32.—The unusually mild conditions prevailing during December, 1931, and January, 1932, brought about the premature emergence of most of the first species to appear in the season. On December 8th I took *Phigalia pedaria*, and this species persisted at intervals during the month. By the middle of January *Hybernia rupicaprararia* was well out. *H. leucophaearia* followed suit quickly. I took several on tree-trunks on January 23rd, while on the 22nd I obtained the first *Anisopteryx aescularia*—a very early date for this species. During the last week of January *Hybernia marginaria* was just beginning to appear.—C. G. M. DE WORMS; Milton Park, Egham, Surrey, February 15th, 1932.

EARLY EMERGENCES.—Mr. F. S. Andrus notes the appearance of *Hybernia marginaria* on January 21st. The first appearance here was on January 11th—a single specimen at light. The species reappeared during the week ending January 30th, and is still abundant. *Phigalia pedaria* appeared on January 4th, and *H. leucophaearia* not till January 27th. An exceptionally early venture was *Anisopteryx aescularia* on February 2nd—a single specimen. There was no reappearance till March 8th. Yesterday evening (March 19th) I saw the first *Selenia bilunaria* (*illunaria*) of the season. Of *H. defoliaria* the last straggler was noticed on January 16th. By the way, is a completely melanic form of *H. defoliaria* known to occur frequently? Barrett does not figure it or mention it. I took a specimen here on October 19th, 1931. Even the hind wings are smoky black, with no trace of the usual sprinkling dots.—E. P. WHITCOMBE; Bewdley, Worcestershire, March 20th, 1932.

* Crosses between *O. filigrammaria* and *O. autumnata* and between *O. dilutata* and *O. christyi* must not be dismissed so readily in such a discussion.

THE POSSIBLE OCCURRENCE OF *CAPUA (DICHELIA)*
GNOMANA, CLERCK, IN THE BRITISH ISLES.

BY H. C. HUGGINS.

ALTHOUGH this moth has sometimes been included in lists of the British Tortricids, its status as a British species is generally discredited. Barrett, in his *Lepidoptera of the British Isles*, x, p. 214, sums the question up as follows, and few will question his conclusions :

“Thirty years ago some evidence was adduced leading to a belief that at one time this species had been taken in the British Isles, and it was provisionally accepted as British. But no further evidence has been received, nor any specimen captured ; and since it is a species not at all likely to have died out had it ever been present, it seems now undesirable to retain it in our lists.”

These words were written in 1905, and since then no further evidence in favour of the British occurrence of *C. gnomana* has appeared.

Last summer I was examining some specimens of *Tortrix costana* from the late J. Cosmo Melvill's collection, when I noticed among them an insect which appeared to me to be a female example of *gnomana*, with which I am acquainted from a continental series in my friend Mr. W. Fassnidge's collection. Like almost all Melvill's micros it was unfortunately without data, but it was set in the same style as a number of small female *costana* amongst which it was placed. The owner kindly gave it to me, and at the end of the season I submitted it to Mr. W. G. Sheldon for his opinion. He kindly took it to South Kensington and confirmed my identification.

The question naturally arises, is the specimen of British origin ? The moth is pinned on a British white pin and set in the British style, in a manner uniform with many of Melvill's specimens. Mr. Sheldon, who possesses an almost unequalled knowledge of the pinning and setting of micros, says that judging from the pin and style of setting the specimen certainly dates between 1850 and 1880, and most probably between 1865 and 1875.

Had the moth been labelled *gnomana* and displayed as such without data in Melvill's collection I should have regarded it as a spurious British specimen, for although Melvill's personal integrity was above suspicion, he bought somewhat indiscriminately, and some of his rarities were of decidedly dubious origin, emanating in certain cases from the egregious Button. As, however, the *gnomana* appears never to have been distinguished from *costana*, an insect no one would import, there seems a sporting chance that the specimen may have been taken in this country, and therefore collectors may think it worth their while to look out for it when

collecting, and to run their eyes over any varieties of *costana* in their series.

C. gnomana, Clerck, may be distinguished from *costana* by the characters of the neurulation which are given by Mr. E. Meyrick in differentiating between the genera *Capua* and *Tortrix*. Superficially the female of *gnomana* may be distinguished from that of *costana* by the narrow continuous median band, which is very strongly angulated towards the apex of the wing; this band in *costana* is much wider, comparatively straight, and usually interrupted in the light forms of the insect, forming a conspicuous costal spot followed by a wide light cloudy marking.

Mr. Fassnidge informs me that *gnomana* inhabits wet places like *costana*, but usually at a considerable elevation above the sea; his own specimens were obtained round a seeping spring in the Pyrenees. The west of England or Ireland would appear to give the conditions most suitable for a search. It may be noted that *gnomana*, Hübner (*nec* Clerck), is a form of *costana*.

I have to thank Mr. W. G. Sheldon for his kindness in verifying the identity of the moth, and placing much of the information concerning *gnomana* in this note at my disposal; and Mr. W. Fassnidge for informing me concerning its habits abroad.

5, Windsor Avenue,
Cliftonville,
Margate.

PIERIS RAPAE IN DECEMBER.—On Christmas Day about 10.15 a.m. I opened the dining-room window when, to my surprise, I found crawling up the sill a freshly emerged ♂ *P. rapae*, with wings just developing. I brought the insect indoors and placed it on a bouquet of pink chrysanthemums. In spite of the warm room the insect apparently slept all day and until Boxing Day morning, when it began to fly towards the sunny window. The insect, a typical spring form, was, however, more than ordinarily rich in the yellow of the underside of the hind wings.—CHAS. E. MORRIS; 2, The Tudors, Tankerton.

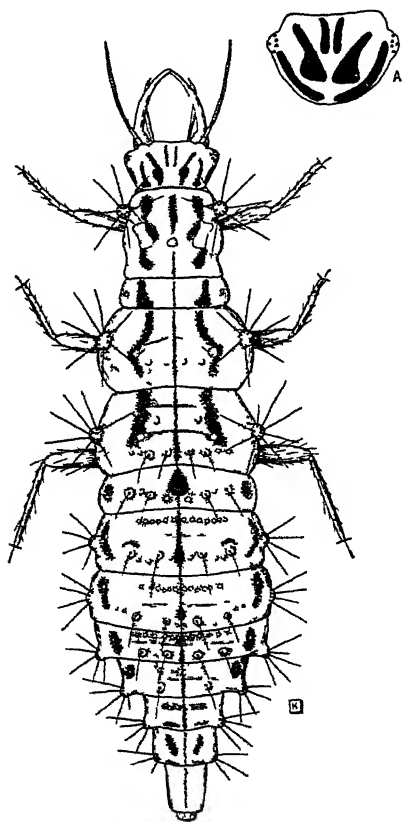
APAMEA OPHIOGRAMMA AT LIPHOOK.—On July 18th last I caught, near Liphook, in the Haslemere district, an *Apamea ophiogramma*. Rather surprisingly this species seems not to have been previously recorded from the district.—R. M. MERE; 38, Great Cumberland Place, Marble Arch, W. 1, November 10th, 1931.

GYMNOSCELIS PUMILATA IN JANUARY.—With reference to my note, which appeared under the above title in the March *Entomologist* (p. 62), it may be of interest to report a similar occurrence of this species to-day (February 28th, 1932). I took a perfect female inside the window of one of my rooms. A strong north-east wind was blowing outside, and the day was very cold, although the room itself faces south and derives considerable warmth from the sun which was shining.—NIGEL T. EASTON; 83, Marine Parade, Brighton.

SOME OBSERVATIONS ON THE LIFE-HISTORY OF
CHRYSOPA ABBREVIATA, CURT.

BY D. E. KIMMINS.

IN June of last year, through the kindness of Mr. K. G. Blair, I received two females of this rather uncommon species, of Green Lace-wing. They were captured on the sand-hills near Braunton, N. Devon, where they frequented patches of *Ammophila*.

FIG. 1.—Third instar larva of *Chrysopa abbreviata*, Curt

The egg is about .9 mm. long and .6 mm. broad on a stalk 2.6 to 3 mm. long. When freshly laid, it is green, marked with yellow, but later it becomes pinkish brown with a white micropylar spot. In captivity the eggs appear to be laid singly and at night.

The newly-hatched larva is about 2 mm. long, whitish in colour, with vague brownish markings. Head (Fig. 1A) with two divergent dark lines from behind forward to the bases of the antennæ and between these lines two sub-parallel lines. Sides of the head behind the eyes brownish.

Third instar larva (Fig. 1).—Length about 7 or 8 mm. Body bearing setigerous warts, those on the prothorax being most strongly developed. General colour whitish, marked with brown and brick-red; median line dark brown, all warts whitish.

Head whitish, marked with brown as follows: two parallel streaks from centre to anterior margin; two oval spots on the vertex, from each of which runs a line to the antennal base; a streak behind each antenna, and a streak on each gena. Antennae and palpi testaceous, jaws castaneous.

Prothorax whitish, with two interrupted brown bands, a transverse band towards the base and a patch near each spiracle brick-red. Meso- and metathorax above whitish with two longitudinal brown bands, a posterior transverse band and a patch surrounding each wart brick-red. Abdomen whitish above, around the spiracles brown, a patch near each lateral prominence reddish. Each segment with two brick-red and brown transverse bands, containing whitish warts. Median dorsal line dark brown. Beneath greenish white, with a broad and a narrow dark brown lateral band. Legs translucent greenish white, tips of tarsi darker.

Unfortunately only four larvae reached the last instar, and of these two died soon after, and none reached the pupal stage. The egg stage lasts about 12 or 13 days, the first instar about 6 days, and the second instar about 8 days. The last larva to die appeared to be full-fed and had been 8 days in the third instar.

The larvae were very active and fed readily on various aphids, but did not carry *débris* on their backs.

VANESSA URTICAE IN FEBRUARY.—On February 27th, 1932, one of the bright sunny days we had in that month, I was surprised to see *V. urticae* sunning itself on a yellow crocus; it was so beautifully bright and perfect that it looked as if it was newly emerged instead of being a hibernated specimen. My garden is in the city of Manchester.—HERBERT MASSEY; Ivy Lea, Burnage, Didsbury, March 21st, 1932.

HYPONOMEUTA VIGINTIPUNCTATA IN GLAMORGAN.—On August 12th, 1931, I disturbed from herbage and netted, at Taff's Well, Glam., a specimen of *H. vigintipunctata*, Retz., this being the first record of this species in the neighbourhood.—W. E. COX; 98, Marlborough Road, Cardiff.

A SYNOPSIS OF THE BRITISH HYMENOPTEROUS FAMILY CYNIPIDAE.

BY CLAUDE MORLEY, F.E.S., F.Z.S.

(Continued from p. 91).

Sub-family EUCOELIINAE.

TABLE OF GENERA.

- | | | |
|------|---|---------------------------|
| (8) | 1. Wings evenly rounded throughout their apices. | |
| (5) | 2. Pilose zone of the second abdominal segment wanting. | |
| (4) | 3. Notauli entire; scutellar cupula large | i. <i>Microstilba</i> . |
| (3) | 4. Notauli wanting; scutellar cupula small | ii. <i>Cothonaspis</i> . |
| (2) | 5. Pilose zone of the second abdominal segment dense. | |
| (7) | 6. Macropterous | iii. <i>Eucoela</i> . |
| (6) | 7. Brachypterous | iv. <i>Glauraspidia</i> . |
| (1) | 8. Wings apically emarginate and often truncate. | |
| (10) | 9. Scutellum produced into an apical spine | v. <i>Rhynchacis</i> . |
| (9) | 10. Scutellum not produced into a spine | vi. <i>Chidotoma</i> . |

Genus i: MICROSTILBA, Först.

Our single species, *M. heterogena*, Gir., was considered by Chitty as entirely synonymous with Kieffer's "new" British *M. striolata* (*Feuil. Jeun. Nat.*, 1901, p. 160); it continues to be very rare, was known in 1890 from only Stirling, among *Equisetum* in August, and Germany, and I have captured but a single ♂, on June 7th, 1912, at Skegness in Lincolnshire.

Genus ii: COTHONASPIS, Htg.

No Eucoeliines have fallen to my net which lacked both mesonotal notauli and a furry band before the abdominal base; and, though the continental distribution is sufficiently broad, this genus still seems represented in Britain by the one specimen of *C. pentatoma*, Htg., that was taken long ago beside Loch Awe in Argyll during June.

Genus iii: EUCOELA, Westw.

Mag. Nat. Hist., 1883, p. 494.

Table of Species.

- | | |
|------|---|
| (32) | 1. Radial cell closed by a marginal nervure. |
| (5) | 2. Wings not pilose or ciliate, partly infumate (<i>Psilodora</i> , Först.). |

- (4) 3. Infumation only below radius; discoidal nervure evanescent 1. *crassinerva*.
- (3) 4. Infumate from basal nervure to apex: discoidal nervure entire 2. *boeni*.
- (2) 5. Wings pilose immaculate, with subelongate cilia (*Eucoela*, s.s.).
- (31) 6. ♂ wings not diverse, nor ♀ flagellar club 6-jointed.
- (20) 7. Antennae of ♀ not abruptly clavate.
- (9) 8. Mesothorax and antennae mainly rufescent 3. *rufula*.
- (8) 9. Mesothorax entirely black throughout.
- (13) 10. Metathorax densely pilose and more or less rufescent.
- (12) 11. Thorax glabrous and nitidulous; scutellum rugose 4. *longicornis*.
- (11) 12. Thorax alutaceous and dull; scutellum striate 5. *marshalli*.
- (10) 13. Metathorax sparsely pilose and entirely black.
- (17) 14. Antennae and legs alone rufescent.
- (16) 15. Venter black; ♀ flagellum longer than body, filiform 6. *gracilicornis*.
- (15) 16. Venter red; ♀ flagellum as long as body, incrassate 7. *mandibularis*.
- (14) 17. Antennae and part of femora black.
- (19) 18. Wings flavescent; antennae as long as body 8. *glottiana*.
- (18) 19. Wings hyaline; antennae shorter than body 9. *atriceps*.
- (7) 20. Antennae of ♀ distinctly clavate towards their apices.
- (30) 21. Flagellar club of ♀ abrupt, 8-9 jointed; length 2-5 mm.
- (27) 22. Discoidal nervure subentire beyond areolet; femora partly red.
- (26) 23. Flagellum black or piceous; length 2-3½ mm.
- (25) 24. Basal fovea of scutellum trans-striate 10. *cutibalis*.
- (24) 25. Basal fovea of scutellum not striate 11. *fortinervis*.
- (23) 26. Flagellum clear red: length at least 4 mm. 12. *erythroceras*.
- (22) 27. Discoidal nervure evanescent beyond areolet; femora all black.
- (29) 28. Radial cell elongate; ♀ flagellar club abrupt 13. *ciliaris*.
- (28) 29. Radial cell broad; ♀ flagellar club gradual 14. *scotica*.
- (21) 30. Flagellar club of ♀ but 7-jointed; length 1½ mm. 15. *heptoma*.

- (6) 31. ♂ wings nude, ♀ ciliate; ♀ flagellar club 6-jointed 16. *hexatoma*.
 (1) 32. Radial cell open to wing-margin (*Trybliographa* Först.).
 (38) 33. Discoidal nervure subentire beyond areolet.
 (37) 34. Antennal flagellum and most of the legs rufescent.
 (36) 35. Wings infumate; first ♀ flagellar joint elongate and club less abrupt 17. *rapae*.
 (35) 36. Wings hyaline; first ♀ flagellar joint short, club abrupt 18. *crassicornis*.
 (34) 37. Antennal flagellum, and most of the legs, black 19. *nigricornis*.
 (33) 38. Discoidal nervure evanescent beyond areolet.
 (40) 39. Nervures infusate; first ♀ flagellar joint the longer 20. *diaphana*.
 (39) 40. Nervures flavous; first and second ♀ flagellar joints equal 21. *testaceipes*.

Though I have captured all the species, excepting the elusive *E. erythroceræ* and perhaps the unsatisfactory *E. (Hexaplasta) hexatoma*, Htg., in the course of forty years' collecting, none can be regarded as of ubiquitous occurrence, but certain of them undoubtedly are found gregariously in favoured localities. Closer collecting than I have been enabled to accord this Family (taken among small Ichneumonidae) is pretty sure to reveal a much more general British distribution than that yet recognized, since kinds at present unrecorded here have been bred on the Continent from puparia of such Diptera as *Musca domestica*, Linn., the Syrphid *Eristalis tenax*, Linn., and hyperparasitically through the Tachinid flies *Ptilops chalybeata*, Mg., *Zophomyia temula*, Scop., *Ocyptera brassicaria*, Fab., *Echinomyia fera*, Linn., and a *Phasia*, as well as from *Agromyza abiens*, *Phora* and an *Anthomyia* (*Nat. Ins.*, p. 165). I have thrown the indigenous species into a rough tabular form above in as natural a sequence as I can, but they are too closely related structurally to allow sufficiency to a mere synopsis: I am sorry to see certain of Förster's "genera," founded upon solely ♀ characters, recently adopted upon the Continent.

1. *E. crassinerva*, Westw. (*Loud. Mag.*, 1833, p. 494 = *Psilodora maculata*, Htg., *Zeits. Ent.*, 1840, p. 201). Certainly uncommon in both Scotland and England. Cambs (Chippenham Fen in late September, 1907) and Suffolk; Tuddenham Fen in August, and on *Heracleum* flowers at Monks Soham at the end of July, 1928. Marshall found this species "upon cow-dung, where it was probably in search of the larvae of *Scatophaga* flies" (*Ent. Ann.*, 1874, p. 120);

but he synonymizes Newman's *Figites syrphi*. While examining nettles in September, 1834, Ingall and Newman found, preying upon the Aphid, *Siphonophora urticae*, Kalt., doubtless, a larva of the fly *Syrphus ribesii*, Linn., to which was attached a *Eucoela* "of considerable magnitude," then extracted. From the back of another of the Syrphid larvae later emerged a second of the parasites, with its head towards the anus of the larva (*Ent. Mag.*, 1835, ii, p. 515; cf. Buckton, *Brit. Aphides*, ii, p. 120).—2. *E. boieni*, Htg., is my largest species of the genus, extending to $4\frac{1}{2}$ mm. Lanark and Middlesex (Cameron, who found it in cow-droppings "probably in search of Dipterous larvae"), Herts (several in coll. Piffard), Suffolk: on *Angelica* flowers at Claydon bridge in late September and at Thorndon on October 13th.

3. *E. rufula*, Först., is known from only Dorset (Dale), Worcester (Fletcher) and Suffolk: ♂♂ were swept on September 20th, 1897, in Bentley Woods, and on September 8th, 1915, at Tuddenham Fen.—4. *E. longicornis*, Htg.; Norfolk (Bridgman), Surrey (Champion), Suffolk: not rare by sweeping in marshes from mid-June to late September at Mildenhall, Brandon, Monks Soham, and once a ♀ occurred in an Agaric fungus on September 20th in Blythburgh Bog.—5. *E. marshalli*, Cam.; Devon (Rev. T. A. Marshall), Surrey (Champion), Suffolk: very rarely swept from reeds on March 17th, 1895, by the Gipping River at Ipswich, and again in September, 1912, at Wangford near Southwold.—6. *E. gracilicornis*, Cam.; Lanark (Cameron), Norfolk: one ♂ was swept in the marshes at Horning ferry on June 15th, 1922.—7. *E. mandibularis*, Zett.; Hants (I. of Wight, June 20th, 1907), Lanark (Cameron), Lincs (Louth and Market Rasen in June, 1912), Suffolk: several ♀♀ were found on September 20th, 1902, in an old bee-skep at Bury (Tuck).—8. *E. glottiana*, Cam.; Hants (Shalfleet in I. of Wight on June 26th, 1907), Lanark (Cameron), Norfolk (Cromer in August, 1903), Suffolk: uncommon in marshes at Brandon, Barnby and Tuddenham during June to September.

9. *E. atriceps*, Buckt. (*Cynips atriceps*, Buckton, *Mon. Brit. Aphid.*, 1879, ii, pp. 106 and 150, pl. lxxiii, fig. 6 = *C. amygdalis*, Cam., *Mon. Phyt. Hym.*, iii, p. 259), ♀. Body entirely black. Antennae pilose, all black, and with their fourteen joints not abruptly clavate, but gradually incrassate and the last the largest. Thorax stout. Abdomen semiglobose, with "obtuse ovipositor." Legs black throughout; tibiae elongately unicalcarate; tarsi pubescent and "six-jointed." Wings pilose and ciliate, with apices "rounded" (pace dexter wing of figure, which shows *Clidostoma*); radial cell closed by marginal nervure. Length not indicated. Several examples were bred in late October, 1878, from nymphs of *Aphis amygdali*, Fonsc. Later, Cameron was unable (*loc. cit.*) to

determine the genus of this female: yet it is quite obviously a *Eucoela* that had, like the above *E. crassinerva*, attacked aphidi-phagous Syrphid larvae. Equally clearly, on account of the figured short antennae with no definite club, it is synonymous with the not uncommon black-legged form of *E. proxima*, Cam. (*Mem. Manch. Phil. Soc.*, 1889, ii, p. 67), who describes (*Phyt. Hym.*, iii, p. 204) the ♀ only, with "antennae nearly as long as head and thorax, without a club," but figures (*loc. cit.*, pl. ix, fig. 8) the ♂ only, having antennae longer than body! I regard *E. atriceps* as one of our commonest species. Essex (Billups), Hants (Godshill in I. of Wight on June 27th, 1907: Morey's Guide), Lincs (several at Louth on June 9th, 1912), Norfolk (Aylsham on June 22nd, 1918), Suffolk: Brandon Heath, Brandeston, Monks Soham and Wangford, during September 7th to October 11th only. Mr. J. T. Wadsworth has given me a pair that were bred at Manchester University on May 24th, 1914, in abundance from puparia of the Anthomyid fly *Chortophila brassicariae* from Northenden in Cheshire; these were recorded, under the erroneous name *Cothonaspis rapae*, Westw., by him (*Ann. Applied Biology*, 1915, ii, p. 159). This misnaming is attributable to Kieffer: and, after its introduction to the United States our *Eucoela* was there redescribed with characteristic avidity as a new species, under the name *Cothonaspis gillettei*, Washburn (Wadsworth *in lit.*, June 16th, 1921), which falls to *E. atriceps* of 1879.

10. *E. cubitalis*, Htg. Not uncommon in Herts (Piffard), Lanark (Cameron), Lincs (Boston and Market Rasen in June, 1912), Suffolk: several on September 6th, 1911, in Wenhamston marshes and several on *Angelica* flowers on August 19th, 1921, at Monks Soham.—11. *E. fortinervis*, Cam. Hitherto unique in the "Gloucester" ♂, doubtless captured by the late J. E. Fletcher. I have a single ♀, swept from marsh-grasses at Oulton Broad in Suffolk on September 22nd, 1913, that is obviously the alternate sex, since it differs only sexually from the male description (*Mem. Manch. Phil. Soc.*, 1889, ii, p. 66) and the nine joints of the flagellar club are well discreted.—12. *E. erythroceræ*, Thoms. The typical ♀ was 5 mm. in length (*Opusc. Ent.*, 1877, viii, p. 819), but Cameron's probably distinct ♀ (*Ent. Mo. Mag.*, 1880, p. 267) from Lanark, "Clydesdale, not rare," is given by him as only $3\frac{1}{2}$ mm.—13. *E. ciliaris*, Zett., *Ins. Lap.*, 1838, i, p. 411. Certainly our most prevalent species; Tipperary (Killaloe on June 17th, 1913), Herts (Piffard), Lincs (Market Rasen on June 11th, 1912), Suffolk: Brandon, Eriswell, Henstead, Reydon. Southwold on reeds, Tuddenham in June and July and September, and on August 29th, 1907, the ♂♂ were abundant upon carrot flowers in my Monks Soham paddock.—14. *E. scotica*, Cam., Hants (Brockenhurst in New Forest on July 7th, 1909), Northants (Castor on June 14th, 1908), Suffolk: swept in marshes at

Ipswich, Barton Mills and Southwold uncommonly in both July and September.

15. *E. heptoma*, Htg. Our smallest species, said to be common, and doubtless much overlooked Perth (Cameron), Notts (Sherwood Forest and Langford Moor in August, 1914), Suffolk: Henham on September 3rd, 1910, on Monks Soham House window on July 9th, 1923, and in a rabbit's hole on Sutton Heath on June 10th, 1919.—16. *E. hexatoma*, Htg. Unknown to me: Lanark and Sutherland (Cameron).—17. *E. rapae*, Westw. Termed "commonly distributed" with us, but I have only one ♂ that was taken in Suffolk on August 9th, 1898, at Burgh Castle. It was discovered by breeding specimens from tumours formed in turnips by the Tachinid fly *Ocyptera brassicaria*, of which *E. rapae* must have been a parasite, though not so considered in 1835 by Westwood (*Loud. Mag.*, viii, pp. 171-179).—18. *E. crassicornis*, Cam. Taynult in Perth on September 20th, 1894 (Beaumont), Lanark (Cameron), Lincs (Spalding on June 5th, 1912), Suffolk: several ♂♂ on *Heracleum* flowers on September 18th, 1915, at Tuddenham, but unnoticed elsewhere.—19. *E. nigricornis*, Cam. The most frequent of our larger kinds. Ayr, Lanark (Cameron), Louisburgh in Mayo (*Proc. R. Irish Acad.*, 1911, xxiv, p. 18), Hants (Godshill in I. of Wight on June 29th, 1907), Somerset (Redland: Charbonnier), Surrey (Greenings: Saunders), Suffolk: Boxford, Framlingham. Mildenhall, Tuddenham, and on September 17th, 1928, at Wissett, though all my other dates are in mid-June. In fact, the whole genus seems to have a June and a September brood, with a few laggard or precocious stragglers between those two months.—20. *E. diaphana*, Htg. Scotland (Cameron), Cambs (Chippenham Fen on September 25th, 1907), Suffolk: Bury on carrot flower on September 20th, 1902 (Tuck), and on *Angelica* flower at Claydon bridge.—21. *E. testaceipes*, Cam., is likely no more than a pale form of the last species. Ayr (Cameron), Herts (Piffard). Hants (I. of Wight on June 28th, 1907), Suffolk: Brandon, Foxhall, Minsmere marshes, Ousden, Reydon, Tuddenham Fen, etc., by no means uncommon.

(To be continued.)

NOTES AND OBSERVATIONS.

THE HIBERNATION OF PYRAMEIS ATALANTA.—The following cutting from the *Western Morning News* of March 2nd last furnishes a very conclusive corroboration of the belief held by, I suppose, a very good number of entomologists in this country that *P. atalanta* can and does, at least sometimes, live through the winter in a state of nature in some parts of the British Isles. I may say that Mr. Hendy lives at Porlock, in Somerset, and can be thoroughly relied on as a careful observer:

" On January 7 my wife showed me a red-admiral butterfly which was sunning itself on a Lawson cypress, whose dark green foliage formed an admirable foil to the brilliant red, white and black of its wings. At one time lepidopterists doubted whether this insect hibernated in this country, but, as Mr. Frohawk has shown, there are some verified instances of its having done so.

" The ' Field,' commenting a year or two ago on Mr. Frohawk's statement, expressed the opinion that the red-admiral's survival of the winter in England was so exceptional that it could not be regarded as a regular hibernator. As, however, I have seen it out at Porlock in December, January, February and March, it looks as if its hibernation was habitual in this favoured district.—*E. W. Hendy.*"
—C. NICHOLSON; Tresillian, Cornwall.

A SYRPHID FLY KILLED BY A FUNGUS.—On August 29th last, in a copse near here, my wife drew my attention to several flower-spikes of the common grass, *Brachypodium sylvaticum*, on each of which were some five or six flies. Examination showed them to be all males of the very common *Melanostoma scalare*, F., killed by an *Empusa*. On September 1st my wife was near Rockbourne, some eight miles to the north-west, and found at one spot the same condition prevailing. Why this congregation in death of the one sex of this fly on a particular species of grass?—F. H. HAINES; Appleslade, Ringwood, Hants, November 21st, 1931.

Dr. F. W. Edwards has kindly supplied the following note giving instances of similar fungoid attacks on flies upon other occasions. In all these cases an *Empusa* would appear to have been concerned, but Mr. Ramsbottom tells me that the fungus might very well be an *Entomophthora*.—ED.

It is not at all uncommon to find large numbers of dead flies affixed to flowers or leaves in one small area and apparently killed by fungus. Various species of flies are so affected, one of the most susceptible being the common dung-fly (*Scotophaga stercoraria*, L.). The British Museum contains examples of this species found dead on thistles at Gorleston-on-Sea, Norfolk (E. A. Ellis); attached singly to tips of willow-leaves at Bexhill, Sussex (Lt.-Col. H. D. Peile), and on Hawthorn twigs at Nottingham (J. Thomson). In each case the flies have succumbed to the attacks of an *Empusa* (? *E. conglomerata*, Thaxter); in the first two cases only females have been preserved, but in the third both sexes are represented, and it seems unlikely that either sex enjoys immunity from the attacks of the fungus either in the case of *S. stercoraria* or in the *Melanostoma* noted by Dr. Haines. A similar case of an epidemic among *Melanostoma scalare* was observed by R. C. Bradley at Sutton, Birmingham, and reported upon in the *Entomologist's Monthly Magazine* (1895, p. 178). In this case the flies were found congregated on flowering stems of a grass (*Glyceriu fluitans*) and of dock; 90% of the victims were females. The editor (R. McLachlan) stated that the fungus had been identified as *Empusa conglomerata*, Thaxter, and while unable to suggest the probable mode of infection, thought the occurrence

of such numbers of dead flies in one area might be explained by the rapid development of the fungus while the insects were feasting.—F. W. EDWARDS.

VANESSIDS, ETC., IN 1931.—Of *Pyrameis cardui* I noted the first specimen in the morning of May 30th. It was in splendid condition, apparently of recent emergence. A few more were noted during the afternoon of the same day. The following evening, about six miles from here, in North Northants, scores were seen flying along the countryside. Subsequent visits during the following three or four weeks found their numbers in no way diminished. The majority of these specimens were remarkable for their freshness. I found three larvae on June 28th, and during the month of July they were abundant on thistle in all parts of the country. I noticed as many as half a dozen on one plant. About two dozen larvae collected all duly reached the perfect state, and the first emerged on July 25th. What happened to all the larvae feeding at large? Did they succumb to the cold wet weather of early August? Except for an odd specimen or so seen on the wing about the middle of August they have been entirely absent. *P. atalanta* larvae (some full-fed) were found on July 3rd, and appeared to be common in all stages of growth, during the month, as also were they in the neighbourhood of Lyndhurst in the New Forest during the first fortnight in August. All larvae collected produced butterflies, the first of which emerged on July 24th. Like *P. cardui*, the imago of *P. atalanta* has been a rarity here this autumn. *Colias croceus*: I saw one specimen near Alconbury, Hunts, on June 27th, and on August 16th secured a freshly emerged ♀ in a lucerne field at Raunds, Northants. Although I have kept a keen look-out I have observed no more. *Vanessa io* has been rather scarce of late years in this part of the county, single specimens only being seen. This year, however, it has been out in force, particularly on August 29th, a brilliant day with high wind, when I saw a small sheltered field literally alive with them. Of *Ployommatus icarus* and *Lycuenopsis argiolus*, both of which are usually abundant in this locality, only odd specimens have been observed. I have not noticed even a single specimen (summer brood) of the latter species.—CHAS. R. ABBOTT; "Ashleigh," King's Road, Rushden, Northants, October 14th, 1931.

COTSWOLD INSECTS, 1931.—Among other interesting species seen in the Cotswolds this last season I turned up *Nemeobius lucina* (end of May), *Demas coryli* (larvae, September 20th), *Stauropus fagi* and *Asthena blomeri* (July 5th), and *Ino geryon* (June). *Odezia atrata* was widely distributed and quite common. I have found *Polia chi* in several localities in Gloucestershire.—P. SIVITER SMITH; Pebworth, near Stratford-on-Avon.

EREBIA BLANDINA (ÆTHIOPS).—The following passage occurs in a letter from a gentleman in Bromsgrove who collects Lepidoptera; "I was on the Old Hills near Worcester yesterday (September 1st, 1931), and saw plenty of specimens of *Pararge egeria*, all of them starting up

from muddy places as I approached. I also thought I saw a specimen of *Erebia blanda* (*aethiops*). I got quite close to it and had a good look at the underside and a momentary glimpse of the upperside, but had nothing to catch it with. The grass on which the larva feeds is common in the Severn district, but it apparently does not occur south of Yorkshire and Lancashire."—P. SIVITER SMITH.

PEBWORTH INSECTS, 1931.—In this poor locality, with elm trees and heavy clay soil, the following species new to the district (three miles round the village) were recorded in 1931: *Epinephele tithonus* ab. *excessa*. Tutt, very common this year; *Smerinthus ocellatus*, one egg and one small larva on willow; *Macroglossum stellatarum*, three specimens in the garden (May 29th, June 17th, June 25th, 1931); *Pterostoma palpina*, a ♀, July 4th, 1931; *Eumichtis protea*, one specimen in the house, September 19th, 1931; oak insects are rare here; *Brachionycha sphinx*, one larva on *Viburnum lantana* in June; *Miselia oryacanthae* var. *capucina*, one specimen at ivy bloom, October 11th, 1931; *Caradrina claripalpis* (*quadripunctata*); *Pachnobia rubricosa*, at sallow, April 9th, 1931; *Xylina exoleta*, two larvae brought me, one being ichneumonid, the other hatching October 5th, 1931; *Thera obeliscata*, one at ivy bloom October 13th, 1931; *Pachys strataria*, a ♂ at light, April 9th, 1931; *P. betularia*, several larvae on willow; *Ortholitha bipunctaria*, a few on the railway, August 22nd, 1931; *Scotosia vetulata*, at light; *Perizoma unifasciata*, larvae very common on *Bartsia odontites* in the autumn; a single *Lozogramma petrarum* was found in the garden, although the nearest bracken is three miles away. Unrecorded species this year will include *Saturnia pavonia*, a cocoon, burnt and scorched by roadside firing, but containing a live pupa, having just been found by me; it is a rare insect here. The total number of species of Rhopalocera recorded in the district is now 24, and of Heterocera 171, excluding the Micros.—P. SIVITER SMITH.

THE LEPIDOPTERA OF AN ESSEX WOOD.—I am pleased to know that Mr. James (p. 69) appreciated my article under above heading, and I am hoping that he will be able to give us a similar article on Ongar Park Wood for historical purposes, although that wood does not seem in any danger of decay at present, notwithstanding the cutting which Mr. James has told us about. I have looked up my diaries for 1893 and 1894, and find that I did not do very much treacling in Lark's Wood in either year, probably because reports of treacling in those years generally were unfavourable. I am sorry now that I did not try it once or twice; I, too, might have been rewarded by capturing *Agrotis tritici* and *obscura*! Mr. James is right about *Osmia affinis* in the wood; some of them were exceptionally well marked with white, but their very dark ground-colour always served to distinguish them at once from *diffinis*, which was always much redder and brighter, and the white decidedly purer. I have no doubt that both species fed upon the elms at the entrance to the wood, but some of these were removed about the end of the century and that *may* have accounted for these species disappearing,

as one sometimes comes across funny little fancies amongst insects for frequenting and feeding upon one particular tree or herb amongst others of the same kind apparently equally suitable. My old schoolfellow, William H. Jackson, of Purley, one of the "others" with whom I used to collect in the wood, has sent me a short list of species he has personally taken there, which I append, all of them being of uncommon occurrence there. *Lyncometra ocellata* (one or two only—they probably fed up on the hedge-bedstraw outside the wood, as I know of no *Galium* inside, and sweet woodruff did not grow there); *Ochyria designata* (very few); *Calostigia pectinitaria* (one or two); *Ligdia adustata* (one; probably had fed-up on the one spindle-bush I referred to); *Bapta temerata* (uncommon). Mr. Jackson adds two more "cuspidates" in *Notodonta camelina* (larvae on oak) and *Pygaera bucephala* (a brood of young larvae on hazel); one "Noctua," *Habrostola triplasia* (one on the wing); and "last but not least," as he says, one *Cossus ligniperda* on treacle! I cannot understand how I came to omit this species, of which I also captured one specimen on treacle on July 1st, 1893.—C. NICHOLSON; Tresillian, Cornwall.

RECENT LITERATURE.

Catalogue of Indian Insects.

Three further parts have just come to hand: Part 21, Lycidae, by R. KLEINE, consists of vi + 52 pp., and lists rather more than four hundred species; Part 22, Phaloniidae and Chlidanotidae, by P. BAINBRIDGE FLETCHER, deals with twenty-two species in iv + 16 pp.; and Part 20, Alucitidae, also by the latter author. In all cases keys to the genera are given, and the references are exhaustive. Of the Alucitidae the author states that "seventy-eight species are enumerated, but it is certain that more remain to be discovered." This family is one to which the author has for many years paid special attention, and it is not surprising to note that he has himself been responsible for the discovery of the life-history details of many of the thirty-five species of which the early stages are known.

U.S. Department of Agriculture.

Farmers' Bulletin No. 1666 (revising No. 908) consists of an almost synoptic and very complete account of insecticides, equipment and methods of controlling orchard insect pests. A few of the more important pests are dealt with separately, but the work deals mainly with apparatus and its use. The bulletin consists of 90 pages, and is illustrated with 78 text-figures.

Transactions of the Suffolk Naturalists' Society.

Part III of Vol. I contains several entomological items. The longest consists of The Neuroptera of Suffolk, and runs to 14 pages. Is it because of the opening sentence, which refers to "the local Spring-tails, Psocids, Storm-flies, Mayflies, Dragonflies and Caddis-flies that go to constitute the Order Neuroptera," that the author remains anonymous? We can well believe it. Guilt

seems to attach to the Editor. Shades of McLachlan! But the list is a useful one in spite of this. An interesting note on the Pine Sawfly (*Diprion sertifer*) by J. C. ROBBINS records the occurrence of two (out of three) hymenopterous parasites for the first time in Britain. CLAUDE MORLEY makes a valuable contribution to our knowledge of the life-history of the Sea-midge, *Thalassomyia frauenfeldi*, only recently confirmed as British, describing the larva and clearing up several obscurities; and in the Observations will be found many notes of local and wider interest. The Society is doing good work, and is obviously very much alive.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 2nd, 1932.*—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Obituary.*—The death of Dr. W. Randall Parkes, a Fellow of the Society, was announced.—*Exhibits.*—Mr. C. N. Hawkins exhibited a nearly all-female brood of *Erannus (Hybernia) defoliaria*. Prof. E. B. Poulton, F.R.S., exhibited and made remarks on (1) direct and indirect evidence of attacks by birds upon butterflies; (2) A Brenthid beetle taken in the nest of an ant (*Camponotus*, sp.) in Nyasaland, by Dr. W. A. Lamborn, O.B.E.; (3) the capture of insect prey by Reduviid bugs of the genus *Amulius*, etc. (further notes); (4) changes in the methods of insect protection at successive periods of growth observed in an Indian Coreid bug, by Major R. W. G. Hingston. Dr. N. C. Joy exhibited an unusual *Carabus*, taken on the top of Mt. Snowdon. Mr. B. M. Hobby made remarks on the prey of sawflies. Dr. K. Jordan exhibited and described calliper-like appendages in some South American moths. Dr. V. B. Wigglesworth gave an account, illustrated by slides, of the so-called rectal glands of insects.—*Papers.*—The following papers were read: (1) The Plume Scales of the Pierinae, by F. A. Dixey, F.R.S. (2) Biological Observations on Some Neo-tropical Parasitic Hymenoptera, by J. G. Myers. (3) Entomological Expedition to Abyssinia, Microlepidoptera, by E. Meyrick.

Wednesday, March 16th, 1932.—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Obituary.*—The death of Mr. Douglas Johnstone, Mr. J. J. Joicey and Mr. A. M. Lea, Fellows of the Society, was announced.—*Election of Fellows.*—The following were elected Fellows of the Society: T. H. E. Jackson, Kapretwa, Kitale, Kenya Colony; Dr. R. Jeannel, Muséum National d'Histoire Naturelle, Paris. *Exhibits.*—Dr. G. D. H. Carpenter, M.B.E., exhibited some Hymenoptera and their mimics. Prof. E. B. Poulton, F.R.S., exhibited and made remarks upon (1) three specimens of *Heodes phlaeas*, L., from South-East Sudan, captured by Mr. E. B. Ford, M.A., B.Sc.; (2) the courtship of a male *Danaiida chrysippus*, L., by the male of *Hypolimnas misippus*, L., observed by Prof. T. Bainbrigge Fletcher; (3) the red stain on *Parnassius apollo* believed to have been caused by liliaceous pollen; (4) a Hawk Moth alighting on and rising from the surface of a pool; (5) attacks of birds on insects recorded about

a century and a quarter ago. Mr. H. StJ. K. Donisthorpe, on behalf of Mr. M. E. Mosely, exhibited a caddis fly, its "case," and the leaf from which it was made.—S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*February 11th.*—Mr. T. H. L. Grosvenor, F.E.S., President, in the Chair—Mr. W. L. Rudland was elected a member.—Dr. Williams exhibited very variable series of *Erannis defoliaria* and of *Hadena psi*, the forms of the latter from Barnes and Scotland being extremely variegated; Mr. S. N. Jacobs exhibited larvae of *Myelois cribrella* hibernating in thistle stems from Bromley, Kent; Mr. Bliss, a banana stem containing the pupa-case of a wasp; Dr. Bull, examples of *Arctia caja* bred in December and January, 34–39 days from pupating; Mr. A. A. W. Buckstone showed a series of malformations of *Pyrameis atalanta*—in a batch of 48 no less than 14 were malformed. They were of a late emergence, the last being bred on November 25th. From the discussion which ensued it transpired that late emergences often had a large percentage of malformation. Lantern-slides were exhibited by Mr. Tonge (ova of Lepidoptera), Mr. Bunnett (plants and insects), Mr. Newman and Mr. Dennis.

February 25th.—The President in the Chair.—Dr. Williams exhibited series of *Hipparchia semele* and pointed out the local variation from Surrey, co. Cork, co. Down, and Swanage; also galls made by *Synanthedon flaviventris* from Surrey; Mr. Bliss, a N. American Syntomid; Mr. A. A. W. Buckstone, the *quadripunctaria* form of *Euchloë cardamines*, which recently had become more common, and dark forms of *Lycia hispidaria* from Wimbledon; Mr. Howarth, a larva of *Cossus ligniperda*, nearly full-fed, from Brandon; Mr. Hugh Main, living centipedes and millipedes, to illustrate his remarks on the life-history of these creatures.

March 10th.—The President in the Chair.—Mr. C. N. Hawkins exhibited yellow-tinted *Boarmia rhomboidaria* (*gemmaria*) from Box-hill in comparison with Wandsworth examples, and *B. repandata*, including a mixed gynandromorph in connection with Dr. Williams's paper; Messrs. A. A. W. Buckstone, F. J. Coulson, Dr. G. V. Bull and Dr. Cockayne also exhibited series bearing upon Dr. Williams's paper; Dr. Williams then read a paper entitled "*Boarmia repandata* and *B. rhomboidaria*," and exhibited a large number of examples and series in illustration of his argument.—HY. J. TURNER, *Hon. Editor of Proceedings*.

ENTOMOLOGICAL CLUB.—The Verrall Supper was held at the Holborn Restaurant on January 19th, 1932. Dr. Harry Eltringham, F.R.S., occupied the Chair, and presided over a very successful gathering. The attendances were as follows: B. W. Adkin, J. H. Adkin, R. Adkin, H. E. Andrewes, H. W. Andrews, Dr. R. Armstrong, E. B. Ashby, S. R. Ashby, Maj. E. E. Austen, R. S. Bagnell, F. Balfour-Browne, H. F. Barnes, Sir T. Hudson Beare, E. J. Bedford, E. C. Bedwell, R. B. Benson, G. T. Bethune-Baker, K. G. Blair, S. F. P. Blyth, E. D. Bostock, Dr. G. V. Bull, Dr. M. Burr, H. Britten, L. C. Bushby,

Prof. Bailey Butler, Dr. P. A. Buxton, Dr. M. Cameron, Dr. Hale Carpenter, S. G. Castle Russell, Dr. E. A. Cockayne, C. L. Collenette, J. E. Collin, J. Collins, L. G. Cox, L. W. R. Cox, E. S. Craske, W. Parkinson Curtis, H. W. Daltry, R. P. Demuth, J. R. Dibb, Dr. F. A. Dixey, A. W. Dodds, H. Domsthorpe, S. P. Doudney, C. A. W. Duffield, H. M. Edelsten, J. H. Edmonds, Dr. F. W. Edwards, H. Willoughby Ellis, Dr. H. Eltringham, W. Fassnidge, Dr. R. A. Fisher, L. T. Ford, G. Fox-Wilson, F. W. Frohawk, J. C. F. Fryer, A. G. Gabriel, A. F. J. Gedye, W. S. Gilles, F. J. Gilliat, E. Rivenhall Goffe, A. de B. Goodman, F. J. Griffen, T. H. L. Grosvenor, H. M. Hallett, A. H. Hamm, H. S. Hanson, C. N. Hawkins, A. R. Hayward, Dr. L. G. Higgins, W. D. Hincks, B. M. Hobby, A. W. Hughes, Prof. S. Issiki, Dr. K. Jordan, Dr. Norman Joy, H. B. D. Kettlewell, Dr. H. Lancaster, F. Laing, H. A. Leeds, H. G. Leeson, G. C. Leman, J. Spedan Lewis, H. Main, W. Mansbridge, A. M. Massee, Prof. S. Maulik, W. T. Mellows, Rev. J. W. Metcalfe, Dr. S. A. Neave, L. Nell, L. W. Newman, L. H. Newman, M. Niblett, F. A. Oldaker, H. E. Page, T. Parker, J. F. Perkins, F. N. Pierce, S. W. P. Pooles, Prof. E. B. Poulton, R. M. Prideaux, L. B. Prout, Capt. E. B. Purefoy, W. Rait-Smith, O. W. Richards, Capt. N. D. Riley, A. W. Richardson, Dr. E. Scott, Dr. D. W. Seth-Smith, Dr. C. D. Sherborn, Dr. H. D. Smart, A. E. Stafford, H. Stringer, E. E. Syms, G. Talbot, W. H. T. Tams, Rev. J. E. Tarbat, E. Taylor, E. Terzi, J. le B. Tomlin, A. E. Tonge, H. J. Turner, C. J. Wainwright, Comm. J. J. Walker, Col. R. M. West, Rev. G. Wheeler, Rt. Rev. W. G. Whittingham, Rev. Preb. A. P. Wickham, V. B. Wigglesworth, D. S. Wilkinson, H. B. Williams, C. G. M. de Worms, C. Worsam, L. H. Bonaparte Wyse.—H. W.-E.

OBITUARY.

D. C. JOHNSTONE.

It is with the deepest regret I have to announce the death of Douglas Charles Johnstone, which occurred on February 17th last, at the early age of 42. Although through life his delicate state of health did not, as a rule, deter him from sport, and often strenuous exercise, it was not until during the past year his failing strength compelled him to abandon his favourite pursuits. From early boyhood he devoted his leisure to the study of natural history, and finally became a keen and successful collector of Lepidoptera. He was elected a member of the South London Entomological and Natural History Society in 1918, and a Fellow of the Entomological Society of London in 1920. Besides entomology he was greatly interested in ornithology, and also in other branches of natural history generally. His lovable nature, unselfishness and generosity endeared him to all with whom he came in contact, both children and adults alike. His large circle of friends found in him companionship of the highest and noblest degree. The loss of his sincere friendship will be deeply felt by all who were privileged to know him, and by none more keenly than the writer of these few lines.—F. W. F.

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DRAGONFLIES IN 1930.

BY H. G. ATTLEE.

At St. Leonards-on-Sea, April 27th, *Pyrrosoma nymphula*, Sulz., appeared, only females seen; May 16th, sixteen *Ischnura elegans*. Lind., seen, only two having blue "tails." A teneral Zygopterid seen May 2nd was probably this species.

Richmond Park. *Agrion puella*, Linn., females, first seen April 20th; *Enallagma cyathigerum*, Charp., first seen April 30th, female. On commons in the Godalming district *Cordulia aenea*, Linn., and *Libellula quadrimaculata*, Linn., were plentiful by June 5th, with a single male each of *Calopteryx virgo*, Linn., and *Calopteryx splendens*, Harr. The former here keeps to shaded brooklets on, or bordering on common-land, the latter to open stretches fringed by bur-reeds, etc., in meadows in Peperharrow Park.

Libellula depressa, Linn., first seen, Richmond Park, June 7th, a female hawking just over the bracken far away from the pools where males were seen.

Cordulegaster annulatus, Latr., male, June 9th, hawking low over heather at some hundred and fifty yards from water, on a common in the Godalming district; *Erythromma najas*, Hans., common at pond there, June 9th, the males resting on water-lilies, where they "fight" much among themselves, and drive off *E. cyathigerum*. They seem very pugnacious for a Zygopterid!

Byfleet Canal, June 15th. *Platynemis pennipes*, Pall., abundant up to the first or second lock near Byfleet, perhaps the most numerous dragonfly. Several were of the form *albicans*. The only *Somatochlora metallica*, Lind., noted on this date flew in a stately, almost *Aeschna*-like manner at 6 to 10 ft. up—very distinct from *C. aenea*; it showed a conspicuous saffron tint. This tint is still more marked in a female, taken June 21st, ovipositing among bur-reeds below the bank.

Anax imperator, Leach, appeared on June 14th in Richmond Park, but was not present at Byfleet on the 15th, though several were there by June 21st; I saw twelve or thirteen species then along the canal within half-a-mile. An uncertain species was *C. annulatus*. I was almost sure it was this species which I saw hawking over a spot where there are tall reeds on the canal, and which settled some 15 ft. up in an oak, where I could see its shape fairly well, but not its colour. I at last disturbed it to try to identify it, when it flew up straight into some pines beyond the canal and I lost it. It was certainly not *A. imperator*; it was of the largest size, and the shape answered best to that of *C. annulatus*. Ottershaw, whence it has been recorded, is but a mile or two away.

Agrion pulchellum, Lind., was not noticed till June 21st when a few males and one typical female were seen. A male *A. puella* was coupled to the latter. On July 5th, again, two male *A. puella* were trying to pair with a female *A. pulchellum* of the form resembling typical female *puella*, but lens-examination of the prothorax proved it a veritable *pulchellum*. Earlier I had seen a male *I. elegans* try to pair with a male *P. nymphula*, and another case in which I think *I. elegans* and *E. cyathigerum* were the species. July 5th, *Aeschna grandis*, Linn., at Byfleet, several *S. metallica* and *Lestes sponsa*, Hans., at Wisley Pond; *L. depressa*, which does not seem a canal species, at Wisley village.

On July 7th, at Pen Ponds, several male *Orthetrum cancellatum*, Linn., were constantly seen on bare sandy bits of bank: one, which escaped all attempts at capture, frequently drove off a male *L. depressa*. A female *depressa* was ovipositing among horse-tails, the male occasionally seen poised above her.

By July 13th *E. naias*, plentiful on July 5th, seemed to be over at Byfleet, as also *Brachytron pratense*, Müll. In mid-July I found *A. imperator* over the Wandle at Mitcham, sometimes hawking for a while along a lately-formed railway-bank of rough herbage, about 20 yards from water. In the same spot *Sympetrum striolatum*, Charp., first seen July 19th; *Aeschna cyanea*, Müll., July 26th (a just emerged female which needed help to get one wing disengaged from its skin, and later a male hawking along bushes under cloudy and almost "misting" conditions).

L. quadrimaculata was last seen (Byfleet) July 27th; *L. depressa* and *C. aenea* (Richmond Park), August 1st; *Ae. grandis* ovipositing apparently on the submerged part of a post and the retaining-wall of a small pond, as well as on water-lilies, St. Leonards-on-Sea, August 25th. Owing, perhaps, to bad weather, *Aeschna mixta*, Latr., was not seen till August 29th at St. Leonards, but from that date was constantly in evidence over the gardens where the above small pond is situated, sometimes together with *cyanea* and *grandis*. Often two hawked amicably in close proximity at about 9 or 10, up to 15 ft., at some distance from the pond: less often one visited the latter, but was remarkably wary; once or twice it settled on bur-reed there, but was several times driven off by the male *cyanea*, which kept almost entirely to the reedy part of the pond, flying mostly at less than a foot above the water; a male *grandis*, keeping pretty constantly to a height of about 4 ft. was occasionally molested by *cyanea* also, but usually each kept to its own zone. In this connection, I noted in July at Byfleet, that when males of *A. imperator* and *Ae. grandis* were on wing together, the latter more than once inclined to be the aggressor, *imperator* scarcely retaliating. Is this because *grandis* is quicker at turning?

At Richmond, when *depressa* is often aggressive, I find *imperator* usually turns on it. This latter, *imperator*, is very pugnacious with its own species. Two males in Richmond Park constantly drove off an unfortunate third specimen which spent its time trying to hawk alternately over their respective territories.

At St. Leonards I saw *I. elegans*, males, last on September 7th; *Ae. grandis*, September 17th.

On September 25th, in town, I watched for some time, occasionally within arm's reach, an *Ae. mixta* hawking, usually at an altitude of from 6 to 10 ft., over Soho Square garden. I had earlier seen one flying in a similar manner about the station-yard at St. Leonard's, Warrior Square. Several *A. mixta* were met with about Weybridge and Byfleet on October 11th, when I took a female at rest on brambles. On October 12th two females of *Ae. cyanea* were ovipositing, sometimes apparently well above the then water-line, on tree-stumps in a small pool in Richmond Park. I may add that in September, 1929, I watched for some time a female of this species ovipositing in the bank of a pond at Hastings, as far as I could see mostly quite an inch or so above the water.

47, Kenilworth Road,
St. Leonards.

CLIMBING ORGAN ON A REDUVIID BUG.

By J. D. GILLETT.

It has been generally stated that climbing organs are wanting in *Reduviid* bugs (Hermann Weber, *Biologie der Hemipteren*, 1930). While rearing a stock of *Rhodnius prolicus*, I noticed that the capacity of the adult insect to climb on smooth surfaces was far greater than that of the earlier stages. The adults could climb on vertical glass, whereas the approximate maximum angle for the nymph stages was about 12°. On examining the leg of the adult I found that there was no pulvillus or empodium on the tarsus, but that there was, on the first two pairs of legs only, a small "fleshy pad" on the end of the tibia, and it is this that functions as a climbing organ. There was no trace of this structure in any of the nymph stages.

This organ in *Rhodnius* is mentioned by C. Stål (1859. *Berliner entomologische Zeitschrift*, iii, p. 99), but he regards it as a depression ("tibiae anteriores apice subtus fossula spongiosa parva instructae"), no mention being made of its enabling the insect to climb. Eduardo del Ponte (1920, *Revista del Instituto Bacteriologico*, ii, No. 5) speaks of an exactly similar structure being present in the genus *Triatoma*, but that he himself has observed it only in *Triatoma megista*. He does not discuss its function in any way.

A detailed account of the function, structure and mechanism of this organ is now being carried out, and will appear in full in a special paper.

NEW SPECIES OF AFRICAN HETEROCERA.

BY W. H. T. TAMS, F.E.S.

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(Plate IV, figs. 1-9.)

NOTODONTIDÆ.

Desmeocraera lithocolla sp. n.

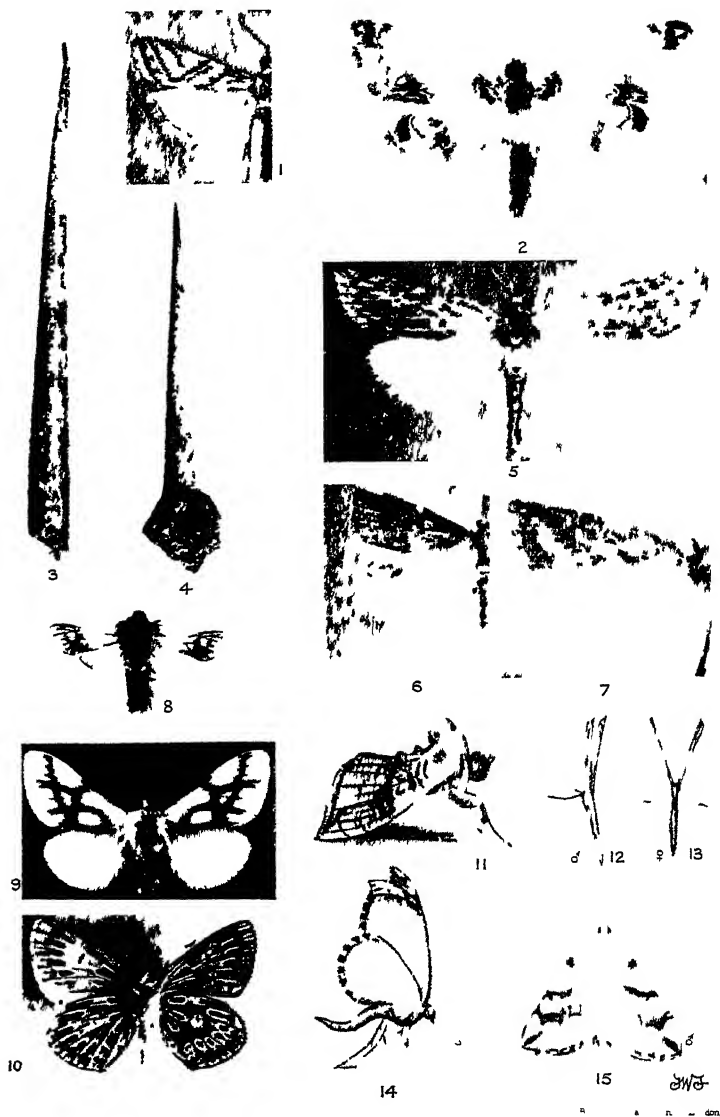
♂.—Palpus cartridge buff tinged with drab and fuscous, fuscous black dorsally. Antennal shaft cartridge buff, pectus honey yellow. Head, thorax and abdomen white to cartridge buff, streaked with drab. Pectus white streaked with drab and fuscous in front. Legs white to cartridge buff, streaked with drab; fore tibia inwardly fuscous black, some fuscous shading at middle; tarsi of all legs ochraceous orange ventrally with each segment dorsally banded with fuscous black at its base. Venter white to cartridge buff streaked with drab proximally to fuscous distally. Fore wing white suffused with drab; a sub-basal spot below costa, fuscous black proximally, white at middle, buff yellow distally; an antemedial series of spots, buff yellow proximally, then white, then fuscous black distally, one in middle of cell, then three obliquely from a point midway between wing-base and junction of vein Cu. 2 with cell, to the middle of the inner margin; two rings of raised scales succeeding the antemedial spots, one roughly circular in the cell (the *orbicular*), the one below the cell oval (the *claviform*); a reniform ring of raised scales at end of cell; a post-medial series of interneural buff yellow spots, the first four oblique from just below costa about 5 mm. from apex to near lower part of reniform ring, the remaining five oblique from just before middle of and below vein M. 3 to inner margin at two-thirds, each spot finely edged proximally with white and fuscous black; a fine fuscous black subterminal fascia deeply crenate interneurally (concavities terminad), the crenations joining to form on the veins long sharp dentations nearly reaching the termen. Fringe drab. Hind wing white; fringe white, fuscous at apex, some small irregularly placed drab patches between apex and anal angle. Under-side both wings white, fuscous edging at apices. Expanse: 44 mm.

Holotype ♀.—Kenya Colony, Kitale, 6.iv.1926 (G. W. Jeffery).

Similar to *Desmeocraera neavei* Tams, which, however, is mainly white. In the original description of that species the generic name was unfortunately wrongly spelt.

Antheua eriostepta sp. n.

♀.—Palpus empire yellow, hair brown laterally. Antenna honey yellow, shaft clothed with cartridge buff scales. Head and thorax



For explanation of figures 1-9 see TAMS p 124, fig 10 see MAPLES, p 137 fgs 11-15 see FROHAWK p 134

empire yellow, tegula outlined with hair brown distally, mesothoracic crest with some hair brown laterally. Abdomen xanthine orange, light buff at base, terminal segments light buff, prominent lateral tufts of fuscous, alternating with hair brown and light buff mixed. Pectus empire yellow shaded with hair brown. Venter empire yellow. Legs empire yellow shaded with hair brown. Fore wing empire yellow: a large spot of hair brown at end of cell, and a subterminal series of small hair-brown spots; from upper margin of cell to inner margin of wing, and extending from wing-base to subterminal row of dots, an irregular patch of hair-brown mottling with a somewhat reticulated pattern, having the appearance of a woolly covering; hair-brown terminal dots interneurally; fringe warm brown. Hind wing light buff, fringe edged with cartridge buff. Underside of both wings light buff, fore wing and costa and termen of hind wing tinged with warm buff. Expanse: 53 mm.

Holotype ♂.—Uganda, Madi, v. 1927 (G. D. H. Carpenter).

Anaphe johnstonei sp. n. (Plate IV, fig. 9).

♂.—Palpus light orange yellow shaded with ochraceous orange, streaked with fuscous. Antenna fuscous black. Head light orange yellow shaded with ochraceous orange. Thorax Naples yellow shaded with ochraceous buff. Abdomen ochraceous orange, each segment edged distally with drab. Pectus and venter ochraceous orange. Legs ochraceous orange, the tibiae shaded with fuscous black, the tarsi fuscous black. Fore wing white tinged with cartridge buff; proximal half of costa drab; a drab, slightly bowed medial fascia from middle of costa to middle of inner margin; a drab post-medial fascia roughly parallel with termen with short faint extensions terminad on the veins; a longitudinal drab fascia from medial fascia almost to termen, lying between veins M. 2 and M. 3; a deeply bowed (convexity costad) drab fascia from near base of inner margin to lower margin of cell and along vein Cu. 2 almost to termen; a drab fascia along inner margin almost to tornus. Hind wing Naples yellow, inner margin tinged with light orange yellow. Underside cartridge buff, tinged with Naples yellow; faint traces of drab fasciae similar to those on upper side of fore wing, faint drab streaks on veins of hind wing postmedially. Expanse: 42 mm.

Holotype ♂ and *paratype* ♂.—Nyasaland, Zomba, 2800 ft., 21.i.1931 (R. F. Johnstone).

Paratype ♂.—Nyasaland, Zomba, 6.i.1915 (C. Mason).

This interesting *Anaphe* looks like a pale *A. ambricia*, but very definitely differs from that species in the absence of dark shading on the distal half of the costa. The type is a perfect specimen generously presented to the British Museum (Natural History) by the collector, Lieut. R. F. Johnstone.

PSYCHIDAE.

Genus *Pyraphlecta* nov.

Proboscis absent. Palpus not projecting beyond vestiture of frons. Antenna with long pectinations on proximal half; length of longest pectinations four times greatest width of shaft. Fore tibia shorter than first segment of tarsus, and without a process; mid and hind tibiae shorter in each case than first tarsal segment; mid tibia only with two terminal spurs, one twice the length of the other; all legs furnished with very long hair-scales hiding the structure. Fore wing with veins Sc. 1 and R. 2 from cell; R. 3 + R. 4 + R. 5 stalked from upper angle of cell, R. 5 stalked for a greater length than R. 3; M. 1 from upper angle; M. 2 and M. 3 from lower angle; Cu. 1 and Cu. 2 from before lower angle; vein A. 1 not distinguishable; A. 2 — A. 3 anastomosed except for a very short separation at wing base. Hind wing with Sc. joined to cell just before upper angle by a sharply oblique cross-vein; veins Rs. + M. 1 only separate for the distal fifth of their length; M. 3 + Cu. 1 stalked for the proximal half of their length, from the projecting lower angle of the cell, with M. 2 and Cu. 2 equidistant from each side of angle; termen sharply curved in and almost parallel with proximal half of costa from vein Cu. 2 to the anal vein. Type of genus: *Pyraphlecta melissodes* Tams, sp. n.

Apparently a highly specialized genus, the type-species of which, though as large as a fair-sized Andrenid bee, bears a superficial resemblance to *Pyropsyche moncaunella* Chapman in coloration.

Pyraphlecta melissodes sp. n. (Plate IV, fig. 8).

♂.—Palpus velvety blackish brown. Antennal shaft velvety blackish brown, pectinations bone brown. Head velvety blackish brown; frons with a small white tuft at middle, vertex with a small white tuft, two further small white tufts behind antennae. Thorax velvety blackish brown. Abdomen (tergum) proximally xanthine orange, distally velvety blackish brown. Pectus velvety blackish brown with traces of white. Venter xanthine orange, with a white spot edged with velvety blackish brown laterally, with velvety blackish-brown spots and spreading tufts of blackish-brown and white hair scales laterally, and terminating in a blackish-brown anal tuft. Legs velvety blackish brown, tibiae proximally and medially banded with white, tarsi distally white to cartridge buff. Fore wing hyaline, with patchy blackish-brown scaling beyond the middle and massed mostly between lower angle of cell and tornus; in changing light the blackish-brown patches show iridescence; blackish-brown scaling on the veins. Hind wing narrowly edged with blackish brown, with some scaling of clay colour along costa. Underside similar. Expanse: 30 mm.

Holotype ♂.—Uganda, Jinja, iii. 1923 (Dr. van Someren).

LIMACODIDAE.

Scotinochroa diplothysana sp. n.

♂.—Glossy. Palpus auburn, ochraceous buff on inner side. Antennal shaft dark greyish brown irrorated with warm buff, pectinations honey yellow. Head with frons ochraceous buff, vertex dark greyish brown. Thorax ochraceous brown mixed with dark vinaceous drab, dark greyish brown in front. Abdomen ochraceous buff, tinged with dark vinaceous brown and auburn, the crests tufted with dark greyish brown. Pectus ochraceous buff mixed with dark greyish brown and dark vinaceous drab. Venter ochraceous buff, shaded with fuscous from base in varying degrees distad. Legs ochraceous buff, heavily shaded with dark vinaceous drab, to dark greyish brown. Fore wing dark greyish brown, costa tinged with auburn, some dark vinaceous drab at base; postmedial fascia rich warm blackish brown with some liver brown intermixed, oblique from costa at two-thirds to inner margin at one-third, with two distinct spots in its course, one in the cell, one just outside the cell, at the origin of vein Cu. 2; traces of a subterminal fascia bowed from just below costa to about the middle of vein Cu. 2, then bowed to just before tornus; area between postmedial and subterminal suffused with light buff; termen edged with warm blackish brown; fringe dark vinaceous drab, with an ochraceous buff line through its base. Hind wing light buff; costa shaded with fuscous, inner margin tinged with ochraceous buff, termen edged with fuscous; fringe vinaceous drab, with an ochraceous buff line through its base, a light buff line through its middle, and finely edged with light buff from costa to vein M. 3. Underside: Fore wing light buff, costa ochraceous buff, edged with auburn, the fore part of the wing largely suffused with fuscous; hind wing underside similar to upper side, costa more broadly infusate. Expanse: 30 mm.

Holotype ♂ and *paratype* ♂.—S.W. Africa, Okahandja, 20-26.i.1928 (R. E. Turner).

PYRALIDAE.

Argyria lutulentalis sp. n. (Plate IV, fig. 6, ♂: fig. 7, ♀).

♂.—Palpus warm buff streaked with fuscous. Antenna light buff. Head warm buff lightly shaded with fuscous. Thorax cinnamon buff streaked with fuscous. Abdomen light buff lightly shaded with fuscous. Pectus venter and legs light buff, fore legs shaded with fuscous. Fore wing cinnamon, suffused with fuscous, except below lower margin of cell + vein Cu. 2, and beyond middle of veins M. 1 to Cu. 2, the outer edge of the fuscous roughly oblique from apex to middle of vein Cu. 2; some very sparse fuscous black irroration; a glossy fuscous subterminal fascia, straight and diverging slightly from termen as it approaches inner margin; a terminal series of internueral fuscous black dots; fringe light buff tinged with cinnamon. Hind wing light buff, lightly suffused with fuscous, termen

fuscous, fringe light buff. Underside both wings light buff, fore wing almost entirely suffused with fuscous, hind wing broadly suffused with fuscous along costa, and with some diffuse fuscous shading on discocellulars; terminal dots on both wings. Expanse: 22 mm.

♀.—Similar, but with cartridge-buff hind wings with traces of fuscous interneural terminal dots; sometimes a diffuse fuscous black spot before and below junction of vein Cu. 2 with cell; hardly any trace of fuscous suffusion on underside.

Holotype ♂.—Nyasaland, Ft. Johnston, 14.iii.1929 (C. Smee).

Allotype ♀.—Nyasaland, Ft. Johnston, 4.iv.1929 (C. Smee).

Paratypes.—2 ♂♂, dated 13.iii.1929, and 4.iv.1929; 2 ♀♀ dated 18.iii.1929, from the same source.

Bred from sorghum stalks.

***Charltona balia* sp. n. (Plate IV, fig. 5).**

♂.—Palpus, antenna, head, thorax and abdomen above and beneath and legs cartridge buff with some delicate drab shading, the palpus and legs sparsely irrorated with fuscous. Fore wing cartridge buff, distal half suffused with warm buff, the whole wing mottled with drab in a diffuse pattern of broken fasciae more or less parallel with termen; subterminal mottling darkened with fuscous; a series of interneural terminal fuscous to fuscous black dots; fringe cartridge buff, chequered with fuscous interneurally. Hind wing white, tinged at inner margin with cartridge buff. Underside fore wing cartridge buff, suffused with drab except along costa, termen (broadly) and inner margin, and also at end of cell; underside hind wing white tinged with drab along costa. Expanse: 29 mm.

Holotype ♂.—Kenya Colony, Lumbwa, 26.iii.1923 (G. W. Jeffery).

***Trachypteryx scelodoma* sp. n. (Plate IV, fig. 1, ♂: fig. 3, larval case; fig. 4, thorn of Camel-thorn).**

♂.—Palpus, head, antenna, thorax, abdomen, pectus, legs and venter pale cinnamon pink. Fore wing pale cinnamon pink; a triangular basal patch between cell and inner margin, its distal edge sharply oblique from before middle of cell to middle of inner margin; within the basal patch, near its distal edge and lower margin of cell, a small, sharply defined white triangle; from middle of costa to inner margin at three-fourths a straight buffy olive fascia with a white line running through it longitudinally nearer to its proximal edge than to its distal edge; a long, waved, sharply oblique, buffy olive and fuscous black discocellular streak, roughly parallel with termen; a straight buffy olive subterminal fascia, edged distally with white, slightly divergent from termen and joining the other fascia on inner margin; termen edged with buffy olive; fringe tilleul buff, a white line along its base. Hind wing light buff; termen finely edged with buffy olive; fringe cartridge buff. Underside both wings cartridge buff tinged with the light buff, the fore wing with a fuscous subterminal fascia. Expanse 24 mm. ♀ Similar.

Holotype ♂ and *allotype* ♀, and a number of paratypes.—Jos, Nigeria (H. Liddiard).

The larva of this pretty little Phycitid feeds on Camel-thorn, and lives in a tapering drab grey case, about 35 mm. long, bearing a remarkable resemblance to the thorns of that plant. I received from Mr. Liddiard a number of these cases, from which emerged, to my astonishment, these Pyralidae.

***Analysia vansomereni* sp. n. (Plate IV, fig. 2).**

♂.—Palpus fuscous black streaked with white. Antenna warm buff, fuscous black at base. Head fuscous black streaked with white laterally. Thorax light buff, tinged with yellow ochre. patagium and tegula with some fuscous to fuscous black scales. Abdomen cartridge buff, segments edged distally with warm buff, the middle four or five segments with a longitudinal fuscous black medial striga, broad anteriorly, tapering to a point posteriorly, about 4 mm. long. Pectus and venter white. Legs white to cartridge buff, the fore femur tipped with fuscous black distally, fore tibia with distal two-thirds fuscous black, fore tarsus with proximal segments tipped distally with fuscous black, distal segments tipped distally with yellow ochre. Fore wing glossy; Naples yellow, white along costa and termen; a small basal patch of fuscous black, its outer edge deeply bowed (concavity basad); a yellow ochre spot in middle of cell, a yellow ochre streak at end of cell, with a few fuscous black scales at upper angle; post-medial fascia fuscous black, commencing as an oblique (terminad) dash from costa at four-fifths, running into a fine crenulate line, bowed (concavity basad) to just before vein Cu. 2, thence sharply basad to near lower margin of cell, curving round and forming a sharp tooth (point tornad) before anal vein, then slightly oblique inwardly to inner margin; from apex to vein M 1, a prominent fuscous black patch with some pale King's blue scaling on it; a similar wedge-shaped spot at tornus, its upper edge on vein Cu. 2, with a patch of yellow ochre above it straggling up to vein M. 1; fringe fuscous black at apex and tornus. Hind wing similar in colour and pattern to fore wing, with no fuscous black at base, and without spot at anal angle corresponding to tornal spot on fore wing. Under-side both wings light buff, glossy, with a fuscous black patch at apex of fore and hind wings, and a tornal spot on fore wing.

Holotype ♀.—Kenya Colony, Nairobi, x.1927 (Dr. Van Someren).

THE DIZZARD VALLEY, N. CORNWALL.—We understand that the Dizzard Valley has been leased by an entomologist interested in the preservation of the local insect fauna, and will be entirely closed to all collecting for a number of years. It is hoped by this means and the careful mowing of part of the bracken and gorse to resuscitate some of the special insects which used to occur in this valley.—ED.

A SYNOPSIS OF THE BRITISH HYMENOPTEROUS FAMILY CYNIPIDAE.

BY CLAUDE MORLEY, F.E.S., F.Z.S.

(Concluded from p. 113)

Genus iv : GLAURASPIDIA, Thoms.

Our single species of this genus, itself most unlikely to prove more than an aberrant form of the above *Eucoela*, is known only in the ♂ sex. *G. microptera*, Htg., is 2 mm. in length and has the wings "abbreviated, hyaline, pubescent, ciliated, the nervures testaceous; radial cellule open, twice longer than broad, narrow; the second abscissa fully one-fourth longer than third; cubitus complete." but their extent is nowhere indicated. Certainly I have seen nothing at all like it, if its figure (*Brit. Phyt. Hym.*, iii, pl. xiv, fig. 1) be reliable: the most curiously inflated posterior tibiae and metatarsi are unmistakable. Recorded with us from only Surrey (Champion) and Devon (Marshall), where this "singular little *Glauraspidia*, the inland analogue of *Clidotoma halophila* and *C. subaptera*, is found rarely under rotten vegetable matter in woods" (*Ent. Ann.*, 1874, p. 120).

Genus v : RHYNCHACIS, Först.

Verh. z.-b. Ges. Wien, 1869, p. 342

Table of Species.

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|--|-------------------------|
| (4) 1. Smaller; scutellar spine obtuse; alar emargination not obtuse. | |
| (3) 2. Alar emargination acute; ♀ flagellar club slenderer | 1. <i>nigra</i> . |
| (2) 3. Alar emargination obsolete; flagellar club stouter | 2. <i>crassiclava</i> . |
| (1) 4. Larger; scutellar spine acute; alar emargination obtuse | 3. <i>nigripes</i> . |

Of this hitherto purely ♀ genus we have three British species, though the right of *R. crassiclava* to such rank is still considered on the Continent to be open to question. *R. nigra*, Htg., which is termed our common kind, has rarely occurred to me in Suffolk by sweeping reeds beside the Gipping River at Ipswich in April. But upon one occasion in March J. H. Charbonnier found two females on a rhubarb-pot in his garden at Shepton Mallet in Somerset along with a ♂, which I can but regard as the undescribed alternate sex of this species. It differs not only merely sexually in having

the filiform antennae 15-jointed with the first flagellar joint the longest and sinuate as in all *Clidotomae*, but in the felled metapleurae like *Glauraspidia* and aborted wings which, as in ♂♂ of *Spilocryptus migrator*, extend little beyond the apex of first abdominal segment, though here nearly parallel-sided and exhibiting no neuration beyond an abbreviated median nervure; the coloration is as in the ♀, though the scutellum is very slightly less produced, with similar broad and bright red mandibles, and wanting notauli: the length is $1\frac{3}{4}$ mm. On the other hand, *C. nigripes*, Cam., recorded from only Middlesex, has occurred with some frequency to Piffard at Felden in Herts and me in Norfolk (Diss in June, 1900), Lincs (Louth in June, 1912) and Suffolk: several on April 27th, 1909, in the just-opened flowers of *Smyrnium olustarum* at Dunwich. My single *R. crassiclava*, Cam., recorded from Sutherland, is in Piffard's Herts collection. I recognize it as distinct from *R. nigra* by nothing but the peculiarly slight and probably inconstant alar emargination.

Genus vi: CLIDOTOMA, emend.

Kleidotoma, Westwood, Loud. Mag., 1833, p. 494; *Klediotoma*, Forst., 1769, et Cam., 1790; *Clidotoma*, Marsh, Ent. Ann., 1874, p. 120

Table of ♀♀ of our species.

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|------|---|--------------------------------|
| (40) | 1. Smaller; flagellum clavate. | |
| (21) | 2. Club of flagellum less than 5-jointed. | |
| (14) | 3. Flagellar club 3-jointed. | |
| (5) | 4. Club occupying half the flagellum. | 1. <i>marshalli</i> , Cam. |
| (4) | 5. Club occupying less than half the flagellum. | |
| (7) | 6. Scutellum apically prominent; length $2\frac{1}{4}$ mm. | 2. <i>longicornis</i> , Cam. |
| (6) | 7. Scutellum not prominent: length at most $1\frac{1}{2}$ mm. | |
| (11) | 8. Legs testaceous, basally darker. | |
| (10) | 9. Antennae shorter than body: basal joints obconical | 3. <i>psiloides</i> , Westw |
| (9) | 10. Antennae as long as body: basal joints elongate | 4. <i>filicornis</i> , Cam. |
| (8) | 11. Legs mainly black. | |
| (13) | 12. Joints of flagellar club compacted. | 5. <i>striaticollis</i> , Cam. |
| (12) | 13. Joints of flagellar club discreted | 6. <i>caledonica</i> , Cam. |
| (3) | 14. Flagellar club 4-jointed. | |
| (16) | 15. Nervures pale, radial cell twice as long as broad | 7. <i>dolichocera</i> , Thoms. |
| (15) | 16. Nervures infuscate, radial cell shorter. | |
| (18) | 17. First flagellar joint double length of second | 8. <i>tetratoma</i> , Thoms. |

- (17) 18. First flagellar joint not double length of second.
- (24) 19. Length 1 mm. ; antennae slender . 9. *gracilicornis*, Cam.
- (19) 20. Length $1\frac{3}{4}$ mm. ; antennae stout . 10. *affinis*, Cam.
- (2) 21. Club of flagellum at least 5-jointed.
- (35) 22. Flagellar club 5-jointed.
- (24) 23. Length 2 mm. ; antennae and legs dark red . 11. *striata*, Cam.
- (23) 24. Length less ; antennae and most of legs black.
- (23) 25. Antennae filiform and as long as body.
- (27) 26. First flagellar joint $1\frac{1}{2}$ length of second, club gradual . 12. *picipes*, Cam.
- (26) 27. First flagellar joint twice second, club abrupt . 13. *elegans*, Cam.
- (25) 28. Antennae incrassate and shorter than body.
- (30) 29. Brachypterous . 14. *subaptera*, Walk.
- (29) 30. Macropterous.
- (34) 31. Basal joint of flagellar club elongate.
- (33) 32. Wings of normal length, apices subtruncate . 15. *truncata*, Cam.
- (32) 33. Wings subelongate, apices acutely emarginate . 16. *longipennis*, Cam.
- (31) 34. Basal joint of flagellar club short oval . 17. *pentatoma*, Thoms.
- (22) 35. Flagellar club more than 5-jointed.
- (37) 36. Flagellar club 6-jointed . 18. *picipes*, Gir.
- (36) 37. Flagellar club 7-jointed.
- (39) 38. Brachypterous (*Nedinoptera*, Först.) 19. *halophila*, Thoms.
- (38) 39. Macropterous (*Heptameris*, Först.) 20. *pygmaea*, Thoms.
- (1) 40. Larger ; flagellum not clavate . 21. *melanopoda*, Cam.

I have no hesitation in accepting, no matter how slight the distinctions, as many species as one can conscientiously, for our tale of parasitic Cynipidae is ridiculously small in its total 77 species—29 *Figitinae* and 48 *Eucoeliinae*—in comparison with the several thousands of *Diptera* that they appear to attack so indiscriminately. Certainly Cameron's work upon the British Cynipidae represents his best and most careful, embracing a good deal more of my friend the late Rev. T. A. Marshall's erudite researches than is acknowledged. This culminates in the present large genus of small insects, which they expanded in 1890 from a minute heap of chaos into an ordered pile of goodly dimensions ; but, even so, the somewhat characterless males eluded adequate classification, as frequently happens among the more obscure

Parasitica. My own material is much too sparse to supply the deficiency : for while collecting Ichneumonidae, I have rarely had occasion to net Hymenoptera of less than two millimetres in length : hence a comparative dearth.

Clidotoma marshalli, recorded from only Devon, is surely among England's common insects, for it has been found in a rubbish-heap in the back garden of a house in the heart of north-west London (by Newberry during October, 1897) ; and I have picked it up on the sands below the coast-cliff at Corton in Suffolk during August. Of the Kirkcudbright *C. striaticollis* several females were in a sandpit on September 22nd, 1922, at Gisleham near Lowestoft ; and the Lanark *C. striata* has occurred to me by sweeping on May 18th, 1911, at Lakenheath in Suffolk. That the interesting little *C. subaptera* is actually congeneric I am not satisfied ; it has been found in Pembroke and in numbers on the Devon coast (Marshall), whence Walker first described both sexes (*Ent. Mag.*, 1835, ii, p. 117) as commonly associating with the equally submarine Proctotrypid *Platymischus dilatatus* Westw. It occurs among decaying sea-weed, " where *Coelopa* and other littoral Diptera abound " (*Ent. Ann.*, 1874, p. 120). I have received the species from Batten near Plymouth, where it turned up in company with the Geodephagid beetle *Aepus marinus*, Ström., in September, 1909 (Keys), and from Scarborough in Yorks, where it occurred on July 17th, 1919 (G. B. Walsh). The Argyll *C. Caledonica* has been found at Felden in Herts (Piffard) ; and the large *C. melanopoda*, hitherto known from Middlesex only, is doubtless not rare at Monks Soham in Suffolk, where I have taken it in June on the leaves of *Deutsia* in the garden and in July on my house-windows ; Piffard found a ♂ in Herts, which he ascribed to this species. Indeterminable males have occurred to me, always in June, at Louth in Lincs, Felthorpe in Norfolk. Brandon and elsewhere in Suffolk.

Thus we see the entire family to be a compact one of quite small numbers, divided thus :

Ibalinae	1
Cynipinae	67
Allotriinae	35
Figitinae	29
Eucoeliinae	48

Total number of British Cynipidae . 180 species.

RESTING ATTITUDE OF *PLUSIA MONETA*, *AGDISTIS BENNETTI* AND *ANAITIS PLAGIATA*.

BY F. W. FROHAWK.

(Plate IV, figs. 11-15.)

THE sketches reproduced on Plate IV, figs. 11-13. of *Plusia moneta* and *Agdistis bennetti* were made from life, and are striking examples of attitudes assumed by moths that undoubtedly on account of their resemblance to inanimate objects afford them great protection against their natural enemies. Although *P. moneta* (Fig. 11) is an abundant species in our gardens, apparently it is seldom seen at rest, owing to the quaint attitude it assumes, which closely resembles a withered leaf or other fragment of vegetation. If touched while at rest it remains motionless and rigid on its feet; as will be seen, it stands high on its front pair of legs, and these are the only ones showing in the individual sketched, which is in the normal resting attitude. The tip of the hind tarsus is only just visible near the apex of the wing.

Figs. 12 and 13 show both sexes of the plume moth *A. bennetti* in its typical resting attitudes, the ♂ lateral view, the ♀ dorsal view. The very slender legs are inconspicuous while at rest.

Figs. 14. 15: *A. plagiata*. On September 1st last at 3 p.m. I boxed (2-in. glass-bottomed box) a male *A. plagiata* which was resting normally on palings. At 6 p.m. I placed the box containing it glass downwards on a table. After dark, at 9 p.m., upon lifting the box I was surprised to find the moth in the remarkable attitude shown in Fig. 14. As it did not move I thought it was dead, but could not account for its stiffened-out attitude, fixed by its feet to the side of the box, or the recurved apex of its right primary and less recurved tip of the left primary. After examining it for about a minute, while I made a rough sketch of its curious appearance, I gave the box a sudden tap, when the moth immediately assumed its normal resting posture, and the artificial light fell upon it. It is remarkable how the moth had the power to recurve the apex of the wing in the manner shown in the figure, and instantly to straighten it out again as in Fig. 15. The only probable explanation of the moth's behaviour which occurs to me is that it might have been sexually calling, which possibly may only occur during the dark after the twilight flight of the male, which is the sex figured.

PLUSIA NI IN S. HAMPSHIRE.—On the evening of June 13th, last year, a specimen of this moth was taken at light at Stubbington House, Fareham, Hants.—BERNARD EMBRY; St. Bartholomew's Vicarage, Dover.

NOTES AND OBSERVATIONS.

LITHOCOLLETIS GENICULELLA IN KENT.—When sweeping up leaves in my garden last autumn I noticed several mines of a *Lithocolletis* in leaves of sycamore. I thought that possibly some *L. sylvestra*, a species which is abundant in this district, had strayed on to the sycamore tree, although the mines were considerably larger than those of that species in leaves of maple. The mines, however, prove to be those of *L. geniculella*, hitherto, so far as I am aware, only recorded as occurring in Oxford.—LEONARD T. FORD: St. Michael's, Bexley, Kent.

THE LARVAL STAGE OF EPIBLEMA CRENANA, HB.—It has long been a puzzle to me why I could not turn up the larva of this local species at Rannoch and elsewhere in Scotland, although I had repeatedly worked for it. Undoubtedly some of the professional collectors of a generation ago, including the Salvages and Wm. Reid, obtained it in some numbers; but neither my friend the late F. J. Whittle nor I had any success. Towards the end of last June, however, in the neighbourhood of Aviemore I collected a bagfull of sawfly-tips, and from them in August bred quite a number of *crenana*. Mr. Woodbridge informed me some years ago he had a similar success in the Rannoch district. It seems probable, therefore, that this pretty little species is more general than I suspected, and that it only wants working for in the proper manner and at the right time. The series bred was a variable one, and included all the known forms as described in the *Entomologist*, lxii, p. 241.—W. G. SHELDON.

APRIL EMERGENCES.—Since my note of March 20th under the heading "Early Emergences" the pendulum has swung back. April, 1932, was exceptionally cold. The thermometer only reached 57° on the 30th, while normally it passes the 60° mark before the middle of the month. There were only six nights with a minimum above 40°. Sallow bloom and spring blossom generally are very backward. *Anticlea badiata*, which first appeared on March 8th, has been plentiful, and *Selenia bilunaria* (*illunaria*) moderately so. The Noctuas started on March 24th, with *Taeniocampa gothica*. There followed *T. pulverulenta* on March 30th, *T. stabilis* and *T. populeti* on April 5th, *T. incerta* on the 8th, *T. munda* and *Pachnobia rubricosa* the next night, *Xylocampa areola* on the 14th, and *T. gracilis* on the 27th. This last was taken at sugar, which I had tried for several nights without success. Between March 27th and April 15th I obtained several specimens of *Pochys straturia*. The male seems definitely to prefer a night of heavy rain for flight. *Malenydris multistrigaria*, which I took at the car headlights in Wyre Forest on April 14th, completes a rather short list. Of the *Taeniocampas* noted *Taeniocampa gothica* has been abundant, *incerta* plentiful, *stabilis* and *pulverulenta* only moderately so, *populeti*, *munda* and *gracilis* scarce. *X. areola* has been quite common, but *P. rubricosa* has only appeared occasionally.—E. P. WHITCOMBE; Bewdley, Worcestershire. May 6th, 1932.

COLIAS CROCEUS: FURTHER RECORDS FOR 1931.—From Major J. C. Eales White, who reported in the *Times* the capture of two *C. croceus* at Felixstowe on August 11th and 18th last, there has reached me a certain amount of correspondence concerning the occurrence of this species in England last year. As most of this refers to districts from which records were few or absent last year, it may be as well to publish the substance of them. H. R. Sweeting (*Times*, September 15th, 1931) reported the species at Kettering on June 30th and fairly common near Bognor at the end of August; Miss F. C. Balston noticed a solitary individual in her garden at Maidstone about August 11th; D. L. G. Joseph observed the species near Eastbourne on August 15th, and again at the end of August at Fairlight, near Hastings; E. J. Horne also saw quite a number in August in the Jevington-Eastbourne-Bishopsgate-Firle Beacon area: also at the end of August it was seen in some numbers at Totland Bay and St. Catherine's Point, I. Of W., by O. N. Hooker and a friend.—N. D. R.

INTRODUCED DIPTERA IN HOT-HOUSES AT KEW.—Many years ago (January, 1912) the small West Indian Dolichopodid fly *Chrysotus longipalpis* Aldr. was discovered by the late Col. Yerbury in a hot-house in Kew Gardens, this being one of the very few known instances of the importation and establishment of an exotic fly into this country; the same fly was also found (1914) by the late Mr. F. Jenkinson in a hot-house at Cambridge, and more recently (1921) by Mr. D. S. Wilkinson at Heston. Another instance of an apparent introduction of an exotic species may now be noted: A specimen of the small Mycetophilid fly *Sciara radicum* Brun. was found by me in the palm-house at Kew in April, 1932. *S. radicum* was first described from specimens reared from lily-bulbs in the grounds of the Calcutta Museum: it has since been found to occur in Fiji and Samoa. Another fly which may not be truly native with us, as it has hitherto only been found in greenhouses in this country, is the Chironomid *Spaniotoma (Orthocladius) furcata* Kieff. An additional British record of this species was obtained by Mr. J. H. Turner, who, in March, 1932, sent specimens reared from larvae said to be causing considerable damage to young prothallia of *Adiantum* sp. at Kew.—F. W. EDWARDS.

SWANZY COLLECTION.—We understand that the Sevenoaks Urban District Council is considering disposing of the Swanzy Collection which is at present housed in their Library and local museum. The collection is of some considerable size, and consists of British and West African Lepidoptera and Coleoptera, the West African element having been derived through the late Andrew Swanzy's connection with the West Coast. When formed, some sixty years ago, it was a fairly well-known collection, and contained quite a number of rarities described by the late Dr. A. G. Butler, whose types are now in the British Museum (Nat. Hist.); certain Coleoptera were also described by other authors. The Sevenoaks Council intend to retain some of the British material, but to dispose of the remainder

either to a public or private museum or to a *bonâ fide* collector, and would be pleased to hear from interested parties. The collections, as they stand, can be seen between the hours of 10 a.m. and 5 p.m., or by appointment with the Librarian and Curator, Mr. G. C. W. Bennett.—ED.

WINTER EMERGENCE OF *DASYCHIRA PUDIBUNDA*.—On June 6th, 1930, I netted a rather worn ♀ *pudibunda* flying in the New Forest. During the night she laid about 90 eggs, which hatched in exactly a fortnight, during the night of June 20th. The larvae fed up (on oak) rather slowly, and it was not till August 28th that the first began to spin. By the end of September all had pupated, and there were then 82 pupae. The cages in which they were kept were about 6 ft. from a large window, which is never closed except when rain is actually driving in and which is very rarely curtained. The temperature, however, was kept fairly even by a central heating radiator, and never varied more than a few degrees above or below 60° F. The first imago, a female, emerged on October 7th. After an interval of over a month another female appeared, followed eleven days later by a third. From this date, November 26th, very few days passed without one or more specimens appearing, with the result that by the end of New Year's Day, 1931, 39 males and 40 females had emerged. Only two were crippled, one of each sex, and the majority were well up to standard as regards size. There was little variation, though several females were considerably darker or paler than the average. A curious point about the whole emergence was that damp, mild days seemed definitely unfavourable, while fog generally produced several specimens, as is shown by the appearance of 2 males and 4 females on December 17th.—O. HOWARD; 78, St. John's Wood Court, N.W. 8.

AN ABERRATION OF *LYCAENA ICARUS* (Plate IV, fig. 10).—Whilst examining a small colony of *L. icarus* at rest on thistle-heads on the artillery ranges, Salisbury Plain, in the hope of finding aberrations in the second brood on August 8th, 1930, my companion Capt. C. F. Parks was fortunate enough to secure a newly emerged male of the streaked form known, I believe, as *ab. striata*. The ground-colour of the underside is creamy grey slightly suffused with black over the fore wings, giving them a smoky appearance. The outer margin of both fore and hind wings has the usual markings normal except for the spots which are confluent on both fore and hind wings, giving the insect a most striking and pleasing effect. The spots in the discal area of fore wings, with the exception of the discoidal spot, are wedge-shaped, the thin end pointing inwards; of those on the inner margin of the hind wings, three in each are pear-shaped, also with the thin end pointing inwards, whilst those of the outer margin become long black streaks, radiating inwards. Being of the second brood, the insect is somewhat smaller than a male of the first brood would be.—SMART MAPLES (Maj.); Orcheston, Shrewton, Wilts.

FIFTH INTERNATIONAL CONGRESS OF ENTOMOLOGY.—The Fifth Congress, which is to be held in Paris, is to be preceded on Saturday,

July 16th, by the centenary celebrations of the Entomological Society of France, the Congress itself occupying the whole of the following week. No precise details have yet reached us as to the programme, which, however, we learn from various sources, promises to be unusually interesting and valuable. Many excursions will be available to those not wishing to attend all the meetings, and there has been arranged to finish up with a week's tour of the Pyrenees (July 24th-30th). Messrs. Thomas Cook & Son have been appointed official travel agents, and from a circular just received from them it appears that the total inclusive cost of the Pyrenean tour will be 1430 francs, and that the journey to Paris and back from London, including hotel accommodation (breakfast only) for the period July 15th-24th, can be covered for as little as £8 14s. It is to be hoped that as many British entomologists as possible will seize this opportunity and so help to make the Congress as successful as the previous ones.—ED.

THE EFFECT OF WIND ON BUTTERFLY MOVEMENTS.—On p. 84 of the *Proceedings of the Entomological Society of London*, dated March 21st, 1931, is an account of immense numbers of a large Mantid and moths being blown onto a ship off the east coast of Africa, which prompts me to put forward my experiences of at least one agent which carries butterflies and other insects such long distances.

Everybody has seen somewhere in the world dust-storms, "sand devils," tornados, cyclones, etc. Now all these are due to a rapidly revolving wind that turns on a small apex, which twists more rapidly than the spread out summit of the disturbance. One day in Japan I was seated on a mountain side looking towards Fuji and at the same time watching a *Papilio bianor maackii*. Suddenly the insect seemed to be caught in a draught or current of air. It began to go round and round in ever-widening circles, with its wings out-spread like a hawk, swaying slightly from side to side as though to keep its balance. As the insect, without once flapping its wings, went round it gradually rose in the air until it disappeared high up above my head, finally passing away as a tiny black dot; and *bianor* is a large insect. It never came down within my view. It was evident that the insect had been caught in some invisible air current, and carried away against its will.

Another instance: I was on a steamer about 10 to 15 miles from the Arabian coast near Aden, when suddenly a small whirlwind came from the land and passed straight over the vessel. The force of the wind was so great that it churned up the surface of the sea into white foam, and made it difficult to stand on deck. It passed in a couple of minutes, and after it had passed and all was calm again, it began to rain locusts and butterflies on the deck. I caught several of a species of *Teracolus* or *Belenois*, I forget which, as they have since become lost.

Now the lesson to be learnt from these examples is that anything caught in a whirlwind (even if only a yard across at its base) gets sucked up according to its character and resisting power, and may

fall anywhere. The disturbance and carrying power in the upper layers of air is remarkable at times even in England. What must be the upper air disturbance for a cyclone or typhoon, which may have a base of revolving wind with a diameter of 250 miles? In the tropics we have whirlwinds of every dimension up to the typhoon. To my mind this sucking-up action, and gradual dying out of air currents at immense heights in different directions, must occasionally catch insects and land them at very considerable distances from their original homes, and they would come to earth again at quite considerable periods of time after the initial whirlwind had died out or disappeared.—J. B. G. TULLOCH (Brig.-Gen.); Hill Court, Abergavenny, April 5th, 1931.

NOTES ON LEPIDOPTERA OF THE CHILTERN HILLS, 1931.—The excessive rainfall and lack of sunshine handicapped observation of butterfly life during the past season, but under abnormal conditions some species appeared to flourish, while others suffered. *Pararge egeria* var. *egerides* was quite common in several localities, especially towards the end of August, although in 1930 it was seldom seen. I always regard it as a typical Chiltern butterfly (since 1920 I have noted it in over 25 localities) and though its numbers vary considerably from year to year, there must be few beechwoods between Dagnell in the North and Henley-on-Thames where it may not be found. *Argynnis adippe* is very seldom seen, usually only odd specimens, so it was all the more pleasing to find it moderately common on one attractive patch of open woodland not previously known to me last July. *Brenthis euphrosyne* was flying in small numbers on the same ground in June, but this species is generally far less common in the hills than it used to be, seldom occurring now in localities where it was plentiful a few years ago. *Pararge megera* is another species that is getting scarce; it has hardly been seen at all during the last two years. *Melanargia galatea* seems entirely to have disappeared from two of the few localities known to me. Towards the end of June quite a number of migrant *Pyrameis cardui* were observed, but the species was not common in the late summer, although single, freshly emerged insects were taken over a wide area (*Plusia gamma* was much in evidence). *Vanessa urticae* was surprisingly scarce; not a single nest of larvae was found although especially looked for, and I do not think I saw six butterflies throughout the summer. Several *Polygonia c-album* were taken near Tring in September, though not by me. *Polyommatus icarus* was not seen until June and was pairing as late as July 5th. The summer brood was correspondingly late and lasted until the middle of September. It is curious that this species is never plentiful on the same ground as *Agriades coridon*, at least in my experience. I have in mind two localities in the Chilterns where *icarus* is common enough every spring, but in August, when *coridon* is abundant in these grounds, its numbers are invariably but a small fraction of the first brood. On other grounds where *coridon* does not occur at all the numbers of the summer brood of *icarus* are at least twice those of the spring. *Agriades coridon*

was really common in several localities from about July 20th, and lasted until the middle of September. *Augiades comma* was still emerging on September 13th; it is very local and always scarce, and at the present day only seems to occur along the western edge of the hills. *Nemobius lucina* is also extremely local; during the last two years I have found it in small numbers in four widely-separated localities, each consisting of a small patch of ground bordering beech-woods crowning rough hillsides. There is little to say about moths. Sugar was tried on fourteen apparently favourable nights between June 15th and end of August, but attracted only 11 species (31 moths), none worth mentioning. Light produced a fair number of common species usually taken this way. *Ino geryon* was flying in fair numbers on one hill in June, and *Zygaena filipendulae* swarmed over a large area near Dagnell in July.—S. B. HODGSON; St. Philip's, Charles Street, Berkhamsted, Herts, October 7th, 1931.

RECENT LITERATURE.

The Natural History of Wicken Fen. Edited by Prof. J. STANLEY-GARDINER, F.R.S. Bowes & Bowes. Price 33s.

This work, which has been issued in six parts, the first in 1923, is now complete. It consists of 644 pages, and contains 56 chapters, 14 plates, 4 maps and numerous text-figures. The Natural History deals in a very thorough and sufficient manner with practically every department and aspect of the fauna and flora of the Fen. There are chapters on "The Fens of the Great Level: Their Drainage and its Effect on the Flora and Fauna," by A. H. Evans; "Full Lists of Plants Growing in the Old Fenland at Wicken," also by A. H. Evans; "The Lepidoptera of Cambridgeshire," by W. Farren; "Wicken and Burwell Fens Fifty Years Ago and Now," by A. H. Evans; "Memories of Wicken," by W. Farren; "Wicken Fen," by Prof. J. Stanley-Gardiner; "Wicken Fen Fauna: A Review," by L. E. S. Eastham; papers on and lists of all the orders of insects, the Crustacea, and Mollusca, by well-known and competent specialists, and on many other subjects. Prof. Stanley-Gardiner has done a great work for Wicken Fen, both in connection with this Natural History, and as the Secretary of the Local Committee of the National Trust; every naturalist who visits or will visit the Fen is under a deep obligation to him. He is to be heartily congratulated on the successful completion of his task. W. G. S.

Faune de France: 23. Diptères: Chironomidae, IV. Par M. GOETGHEBUER. Paris (Lechevalier), 1932.

With this volume Dr. Goetghebuer completes his work on the Chironomidae in the *Faune de France* series, dealing with the sub-families Orthoclaadiinae, Corynoneurinae, Clunioninae and Diamesinae. The work will be of great use to British students of the group as it deals with all species found in Britain, not only describing the adults, but also giving some account of the larvae and pupae of each genus. A very valuable feature is the redescription and figuring of a large

number of Kieffer's types, but the author does not claim to have included all Kieffer's species, and there are in fact many omissions; moreover, it is to be feared that the keys are not very trustworthy. In his classification Dr. Goetghebuer follows rather closely the scheme of my revision of the British species published in 1929, the chief differences being that Philippi's name *Spaniotoma* is not accepted; the subgenera of my paper are raised to the rank of genera, the species-groups to the rank of subgenera, and the genus *Corynoneura* to the rank of a subfamily. It may be questioned whether these changes were necessary or desirable, but they make little difference in practice. In regard to the name *Spaniotoma*, I do not think that there can be any reasonable doubt that the type-species (*S. bivitata* Phil.) is very closely related either to *Psectrocladius turficens* Kieff. or to *Dactylocladius curtistylus* Goet. In my revision of the group I retained the former in the subgenus *Psectrocladius*, but placed the latter in a special group of the subgenus *Orthocladius*, but a re-examination of the material convinces me that the two species belong to the same group, and that *S. turfacea* should be removed from the subgenus *Psectrocladius* to Group F of *Orthocladius*, which might bear the name *Spaniotoma*. Four new subgeneric names are introduced by Dr. Goetghebuer, but for three of these type-species are not indicated; I hereby designate the following: *Gymnometriocnemus*, *M. subundus* Edw.; *Pseudorthocladius*, *S. flexuella* Edw.; *Pseudosmittia*, *S. angusta* Edw. The name *Heterotanytarsus* Spärck is certainly wrongly used. It was introduced for larvae attributed to "*Metriocnemus*" *apicalis* Kieff., but as I have suggested by implication (*Trans. Ent. Soc.*, 1929, p. 348), these larvae were wrongly associated with *M. apicalis* and were most probably those of a *Tanytarsus* of the subgenus *Stempellina*, with which *Heterotanytarsus* must be treated as synonymous. The adult of *M. apicalis*, in spite of the possession of a few hairs on the wing-membrane, should not be separated from the *Dactylocladius* group. Dr. Goetghebuer's treatment of the species of *Trisocladius*, and his inclusion in this genus of *Hydrobaenus*, *Psilocerus* (much older names) and *Symbiocladius*, is not satisfactory, and these species will certainly require re-arrangement.

F. W. EDWARDS.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, April 6th, 1932.*—Mr. R. W. Lloyd, Vice-President, in the Chair.—*Election of Fellows.*—The following were elected Fellows of the Society: Arthur Egbert Andrews, Indian Tea Association, Tocklai Experimental Station, Cinnamara, Assam; Charles Bartlett, Morwenstow, 8, Woodhill, Portishead, near Bristol; Thomas Leslie Green, 4, Albert Bridge Road, S.W. 11; J. E. Pinder, Melissa, Belle Vue Road, Salisbury.—*Obituary.*—The death of Mr. C. Matthews, Mr. R. Stanway Parris, Mr. M. G. L. Perkins and Mr. R. South, Fellows of the Society, was announced.—*Presentation.*—The presentation to the Society by Mrs. Selwyn Image of two paintings was announced.—

Exhibits.—Mr. E. B. Ashby made remarks on attacks by birds on insects. Dr. E. A. Cockayne, on behalf of Mr. T. A. M. Nash, exhibited a *Sphodromantis* with its prey, a *Convolvulus* Hawk-moth. Dr. G. D. H. Carpenter exhibited and made remarks on instances of protective resemblance to bird-droppings. Mr. Hugh Main gave an account of some insects and other animals recently introduced in imported products. Mr. H. M. Edelsten exhibited and gave an account of an aberration of *Colias croceus*, and of a variation in *Chrysophanus dispar batavus*. Dr. F. A. Dixey made remarks, illustrated by lantern-slides, on certain points concerning the scent-scales in members of the Pierine genera *Delias*, *Daptonura* and *Belenois*.—S. A. NEAVE, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*March 24th, 1932.*—The President in the Chair.—The decease of a member, Mr. J. J. Joicey, was reported.—Mr. Ennis exhibited a series of *Phigalia pedaria*, including ab. *monocharia*, taken on Wimbledon Common; Dr. H. B. Williams, series of *Pieris napi* of different broods from the Irish Free State; Mr. McNulty, a large number of preserved larvae and young larvae of *Neuronia popularis*; Mr. Dudbridge, larvae of an unknown species, apparently lepidopterous, found hanging in threads from a hole in the ceiling of a house; Mr. C. N. Hawkins, series of *Manestra pisi* bred from larvae taken on Barnes and Wimbledon Commons, and called attention to the variation; Mr. Niblett, several species of gall-wasps, illustrating their alternating generations; Mr. Tonge, specimens of a pale yellowish-brown form of *Boarmia repandata* bred from ova. Reports were made of the season. Lantern-slides were exhibited by Mr. E. J. Bunnett and on behalf of Mr. Bedford.—HY. J. TURNER (*Hon. Editor of Proceedings*).

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at Caracas, Ditton Hill, Surbiton, on March 3rd, 1932, Mr. W. J. Kaye in the Chair. Members present, in addition to the Chairman: Mr. Robt. Adkin, Mr. Jas. E. Collin, Mr. H. Donisthorpe, Dr. Harry Eltringham, Prof. E. B. Poulton, Mr. H. Willoughby-Ellis. Visitors present: Mr. J. A. Simes, Mr. G. C. Leman, Mr. C. H. Lankester, Dr. Karl Jordan, Mr. C. N. Hughes. The guests were received by Mr. and Mrs. Kaye in the drawing-room, where tea was dispensed by Mrs. Kaye. The comprehensive and interesting collections of Lepidoptera were on view throughout the evening. Supper was served at 8 o'clock. During the evening it was announced that Dr. Karl Jordan had been nominated a Fellow of the Royal Society. A very successful and most enjoyable evening was spent.—H. W.-E.

OBITUARY.

JAMES JOHN JOICEY.

Mr. Joicey, who died suddenly at his home, The Hill, Witley, Surrey, on March 10th, at the early age of sixty-one, was undoubtedly the most lavish patron of Entomology, in so far as butterflies and

moths are concerned, that this country has ever boasted. A boyhood interest in insects was encouraged by his parents, and stimulated into more useful activity through a journey round the world at a rather later date. It was not until he was already nearly forty, however, that Mr. Joicey can be said really to have embarked upon the formation of a museum and the serious study of the Lepidoptera. In 1910 he acquired the Henley Grose-Smith Collection, and three years later the even more important Herbert Druce Collection. Thereafter, between 1913 and 1921 he bought the collections formed by Roland Trimen (1916), Colonel Swinhoe (1916), Lt.-Col. C. G. Nurse (1919), Hamilton Druce (1919), H. J. Elwes (1920), Wichgraf and Suffert (1913), Riffarth (1919) and Dognin (1921). Not all of these were complete, but they resulted in the acquisition of a large amount of material and very numerous types. Already, in 1914, Mr. Joicey's collections were far in excess of what he could himself handle, and he engaged Mr. Talbot as curator with a staff of assistants.

At different times Mr. Joicey employed special collectors, notably the Pratts, to explore various regions on his behalf. The Pratts in 1912 visited Peru and the Amazons; in 1913 and 1914 they spent several months in Dutch New Guinea, principally in the Arfak Mts., and in the Schouten Islands and Waigeu; in 1919-1920 they went to Ceram, and from there twice to the Weyland Mts. in Dutch New Guinea and to Mefor Island; in 1921 they collected on Mt. Korintji in Sumatra, and in 1922 in the Island of Buru. In all they made three separate expeditions, the last one being by far the most important. All were extraordinarily productive of new and interesting species, such as *Papilio procus* and *Orinoptera prattorum*, and from the scientific point of view well repaid the large sums of money spent upon them. Later, Mr. Joicey turned his attention more particularly to Africa, and by financing the late T. A. Barns (1920-1925) secured several magnificent collections from Central Africa and the islands in the Gulf of Guinea. By purchase also from resident collectors in all parts of the world, and from dealers, about nine hundred others collections, consisting of only two or three specimens or several thousand, were obtained in the last ten or twelve years. The total number of Lepidoptera which found their way to the Hill Museum during its existence cannot be ascertained, but it was estimated about two years ago to contain upwards of 380,000 specimens. Prior to that date, however, Mr. Joicey had already presented to the British Museum (Natural History) approximately 75,000 specimens, and disposed of others in various directions.

At the time of writing the fate of the collection is in the balance. Although Mr. Joicey had expressed his wish that it should be presented to the British Museum, and thus become the property of the Nation, his estate was so embarrassed at the time of his death that it has not been found possible to give expression to this wish. The matter is likely to be taken to the Courts for decision; and one may be forgiven for hoping that it may not have to come under the hammer. Such a fate, for lepidopterists, would be a calamity. But whatever its fate, there will always remain in the papers published in the

Bulletin of the Hill Museum and elsewhere a lasting and very valuable memorial. Of the butterflies it can truly be said that they had been very thoroughly worked out, and that little remained to be described; moreover, a catalogue of the types in these families was already in type when Mr. Joicey died and may yet, we hope, be published. Of the moths this unfortunately does not hold true. During the sixteen years which may be said to cover the active period of the Museum a total of eighty-two papers was published in journals other than the *Bulletin of the Hill Museum*, and in that journal there appeared a further 111 articles and 80 plates. The majority of the papers are of a purely systematic nature, consisting of the description of new species or the revision of various genera; but there are several of principally faunistic interest, as, for example, the Catalogue of the Lepidoptera of Hainan. They represent a contribution to the study of the exotic Lepidoptera of very great scientific value. Only one task, Mr. Talbot's monograph of the genus *Delias*, remains unfinished, and it is to be hoped that means will eventually be found to complete the publication of this elsewhere, for it would be a great pity were it to be lost.

The closing of the Hill Museum and the disbanding of its staff are events which will have serious repercussions throughout the ranks of lepidopterists in all parts of the world, and will definitely retard the advance of this science. In a comparatively short space of time Mr. Joicey accomplished much for his favourite study. He was buried at Sunningdale on March 16th.—N. D. R.

JOHN CUTHBERT ROBBINS.

It is with deep regret that we have to announce the death of this very promising young entomologist, whose tragic end occurred at Bletchingley in Surrey on April 11th, as the result of a motor cycle accident whilst he was on his way from his home at Limpsfield to his work at the Laboratory of the Imperial Institute of Entomology at Farnham Royal.

He was, in a manner, cradled in Entomology, for his father, Mr. R. W. Robbins, is, and has been for many years, well known in metropolitan entomological circles. The deceased, who was 26 years of age, was a valued and very able member of the staff of the Imperial Institute of Entomology, so much so that he had been selected to represent the Institute on an important mission in Trinidad and Brazil in connection with economic entomology, and was actually making preparations for his journey at the date of his death. He was of a very amiable and likeable disposition, and was deservedly extremely popular with a wide circle of friends and acquaintances, both around his home and in entomological circles. He was elected a Fellow of the Entomological Society in 1926. It was a most sad and regrettable end to a young life of rare promise.

To Mr. Robbins, who since the loss of his son has sustained the further crushing blow of the loss of his wife, the result of shock following an operation, we desire to join in the deep sympathy which all will feel for him in his double bereavement.

W. G. S.

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HYDRILLA PALUSTRIS HB. (LEP.): NOTES ON THE LIFE-HISTORY.

BY H. M. EDELSTEN, F.E.S.

A MOST interesting account of the capture and breeding of *Hydrilla palustris* Hb. in Germany by Herr H. Raebel appeared in the *Int. Ent. Zeit.*, No. 6 (May 8th. 1930), and it is with the hope that his experiences with this insect may prove helpful to British entomologists that I give an abstract of them. The locality where he first took the insect (at light on June 7th, 1912) was not a marsh, but a grassy spot on the edge of a pine-wood. He says he never met with the insect in wet meadows—its habitats were dry rather than moist. A few buckthorn and oak bushes grew in it, and low-growing plants were represented only by sorrel [? dock], and scattered whortleberry. The emergence is spread over about fourteen days, and if the spring has been a normal one the insect begins to appear between May 12th and 20th. In 1928 and 1929 he did not see one until the end of May. In 1914 on May 20th he had searched the whole area, which was only a small one, before dark without seeing anything; he then lay down and looked across it in the hope of seeing something fly up, but with no success. At 9.30 p.m. he lit his hand lamp and shone it around before rising, and was astonished to see within a radius of 2 or 3 metres 5 ♂♂ sitting on the grass-stems. He took 25 fresh ♂♂ that evening and left others that were worn. The light of the lamp did not disturb them. At 11 p.m. he found a ♀ at a spot he had already searched at least ten times. He concludes that she had only just walked up. The next evening was just as successful, and he took another ♀ at about the same time as on the previous evening. As it was rather worn he took it home for eggs. The proportion of ♂♂ to ♀♀ captured in this locality over a period of ten years was 150 fresh ♂♂ to 3 ♀♀ (damaged examples were not included as they were not taken). He mentions that once only during this period, on a very sultry evening, soon after dark about 9.30 p.m. on June 8th, 1912, did he see the insect really active; usually it sat about on grass-stems and would only fly when disturbed. Once he took a ♀ flying right at the beginning of the flight period, when there were no active ♂♂ about, and a friend took one flying at dusk in another locality. He concluded that the ♀ was only active on especially favourable evenings. On May 22nd, 1923, he captured a ♀ by accident about 5 o'clock in the afternoon in an old osier-bed, which he says was certainly denser, but no damper than the other localities. He thinks this ♀ may have been attracted by the electric lights of the

railway station which was near, as although he searched the spot after dark he found no males. He subsequently found a few in a locality about 500 metres away, and suggests that the ♀ came from there. Another collector took a ♀ in 1916 at an electric lamp in the middle of the town, and on another occasion (June 9th, 1924) he himself found a ♂ lying in a puddle under an electric street lamp in the village. He suggests that occasionally the species makes considerable flights, and mentions that owing to the first locality in which he found the insect having become devastated by the fumes of a coking plant which had destroyed the vegetation, the insect had moved 600 metres further away, and now occurs in a spot which, although suitable, he had not previously found it in.

The ♀♀, fed daily, laid their eggs—200–250 in all—on the sides of the breeding-cage in six to eight days. He gave the young larvae at first dandelion, narrow-leaved plantain, sorrel (? dock) and lettuce. Afterwards he gave them only dandelion. They grew rapidly. He made the mistake in giving it to them rather damp, so that some 180 larvae died when full grown. The ♀ he took on May 25th, 1916, only laid about 80 eggs. He took more care with the larvae from these and kept them in metal boxes about 10 cm. deep, with a layer of 5 cm. of peat-mould in the bottom and a sheet of paper on the peat. On this he put the dandelion, but only in a withered state. The larvae hid beneath the food, sometimes in the peat, and fed only at night. By the end of August they were fully grown and prepared slight earthen puparia on the surface of the peat. He anticipated that according to Spuler they would hibernate in these and pupate in the spring. He was therefore surprised when he opened a puparium after eight days to find a pupa within. This changed colour in a few days and produced a moth after fourteen days. All those larvae which formed puparia produced moths—60 in all, half males, half females. About 10 larvae did not form puparia, and hid mostly in the peat. He put the cage out in the open, putting in food from time to time, but in the spring these larvae were all dead. The ♀ captured on May 23rd, 1923, laid only 105 eggs, and from these he got 95 larvae. Some of these he gave away, and 10 larvae were put on the living food-plant in a specially designed cage out in the garden. The remainder produced, as on the first occasion, a second generation of 66 moths—22 ♂♂ and 44 ♀♀. Those larvae put out of doors, which were mostly in their last instar, went on feeding until late autumn, and then hid in the peat. At the beginning of the following April he cleared out the cage, but could only find 5 larvae, which were hiding under the dried leaves of the food-plant. These larvae pupated after a few days without feeding. He mentions that this does not agree with Spuler, who states the larvae hibernate

in their puparia and, like *C. morpheus*, pupate therein in the spring, but rather confirms the statement of Pastor Standfuss, who reported that he had sifted larvae of *palustris* out of dead leaves in the spring.

Herr Raebel mentions that, considering the few females found in a wild state, it is remarkable that when bred they outnumber the males. He was unable to get the second brood to pair. A search for the larvae in the locality in which he took the moths was unsuccessful, and he could find no trace of any larva having fed on the sorrel (dock) or whortleberry, and therefrom concludes that the natural food-plant is grass. (Herr Fritz Hoffmann states he found two larvae by night on grass in Styria.)

Comparing Herr Raebel's observations with our own, it appears that *H. palustris* appears rather earlier in Germany than in Britain, probably owing to their seasons being more regular than ours. The average date in the fens is between June 5th and 18th. The Carlisle specimens were, however, taken between May 20th and June 9th. While now confined to Fens or marshes with us, it no doubt once was spread over a wider area before the Fens were drained. In his locality the terrain seems to be of a drier nature, though the fact that *Rhamnus* was growing there makes one suspect that the place was moist underneath and probably wet in the winter. The habit of the males in walking up the grass-stems after dark and sitting about has not so far been noticed here, though many long hours have been spent in searching. In our localities we never see the insect until it comes to light between 11 p.m. and midnight. The capture of one or two odd females early in the evening coincides with the Carlisle records, but it is quite possible that they were disturbed by the collectors moving about or were engaged in egg-laying. The females of some species when thus busy will often fly early, especially if the evening is at all sultry. The real flight time of the female appears to be about 11 o'clock, as Herr Raebel mentions that he found two specimens about this time, and that a ♂ and ♀ paired in his breeding-cage at the same hour. It does not follow, because the second brood produced more females than males, that this does not happen with the first brood. The female is evidently very obscure in its habits, and the fact that he only took 3 ♀♀ to 150 ♂♂ does not prove that they were not there. How very seldom do we find many ♀♀ of *P. arcuosa* or *A. cinerea*! It is interesting that the insect should so readily produce a second brood when bred in confinement. Is it not possible that it sometimes does the same in a state of nature, and that is why it is so spasmodic in its appearance? Even in Germany it appears to be very local, and it is quite likely that we have not found the actual headquarters of the insect in the Fens, but that those

specimens we get at light are only stragglers, as Herr Raebel mentions that specimens were taken in the village at some distance from the breeding-ground. It is curious that he should give the larvae dandelion when he concludes that the natural food-plant is a grass. Herr Raebel is to be congratulated on his success in finding and breeding the insect, and on his most interesting observations.

I am indebted to Capt. N. D. Riley for his translation from the German.

Bramble Hill,
Balcombe,
Sussex.

A NEW SATYRID BUTTERFLY FROM THE ORANGE FREE STATE.

BY N. D. RILEY.

Pseudonympha vigilans robertsoni ssp. nov.

♂. Upperside ground-colour rather greyish brown; fore wing rufous patch almost circular and completely surrounding the origin of vein 2; ocellus without any trace of blue, its outer ring very pale; hind wing entirely devoid of rufous area. Underside very uniformly brown, with only the faintest suggestion of grey irroration on the hind wing; hind wing with two quite small and subequal ocelli, one in area 2, the other in area 6, the former sometimes slightly the larger.

♀. Exactly similar to the male except that the rufous area of the fore wing and the ocelli of the hind wing are rather larger.

Length of fore wing: ♂, 19 mm.; ♀, 21 mm. Holotype ♂ and allotype ♀, "Kimberley, Africa, Stone Street: Godman-Salvin Coll. 97-52" in British Museum. Other material consists of another pair from the type-locality; three males from Bayswater. Bloemfontein, taken on October 31st, 1920 (1 ♂), and November 6th, 1921; and 1 ♂, Bloemfontein, November 17th, 1917, taken by P. R. Robertson.

It was at first thought that these specimens might be referable to subsp. *johannesburgensis* Wichgraf (*Int. Ent.*, v, p. 173, 1911), with which in general coloration of the upperside they agree; but the uniformly brown hind wing, the almost complete absence of grey irroration and the different outline of the rufous fore wing patch, as well as their extraordinarily small size, at once distinguish them. Typical *vigilans*, with its dark ground-colour, rich chestnut-brown patch and large blue-shot ocellus is quite at the other extremity of variation in the species, the middle position being held by *johannesburgensis*. It is remarkable that this very distinct race, to which Mr. P. R. Robertson has kindly called my attention, should have remained so long unrecognized.

PSELNOPHORUS BRACHYDACTYLA, KOLLAR, AS A
BRITISH SPECIES, WITH NOTES ON ITS EARLIER
STAGES.

BY W. G. SHELDON.

THE first recorded occurrence in this country of *Pselnophorus brachyductyla* concerns two specimens taken by Farr, of Yarmouth, a well-known collector of Lepidoptera at that date, as written in his diary: "June 17, 1842, took two specimens of *Pterophorus trichodactylus* in a wood by Sir John Leathern's boat-house at Herringfleet; beaten out of alder bushes by me and Charles Paget." This information is given by Barrett, *Lep. Brit. Islands*, ix, p. 396, who says "one of the specimens is in the collection of [the late] Geo. Bird; the whereabouts of the other is not known." The name "*trichodactylus*" is an error, but there does not seem to be any doubt but that Farr's specimens were *brachyductyla*.

The next capture is recorded in *Scottish Naturalist*, ii, p. 208 (1874), by Sir T. Moncrieff. The locality given is Blair Atholl, by which probably Glen Tilt is indicated. Barrett, *l. c.*, says, "Buchanan-White states another was captured in the same locality." A third example was taken on July 19th, 1920, in Glen Tilt by the late F. G. Whittle (*Entom.*, liv, p. 90).

Barrett, *l. c.*, states the late "J. B. Hodgkinson had a specimen said to have been taken by a working collector in Cumberland."

The great locality in Britain for *brachyductyla*, so far as at present known, is, however, the Cotswold district of Gloucestershire, where it has been detected with some frequency of recent years.

Mr. C. G. Clutterbuck informs me that the first specimen captured in this region was taken by the late A. B. Farn on a rainy and windy day in 1894, and that no more examples were met with until 1897, when N. V. Sidgwick took two, and also three in 1898. In Farn's collection, when sold at Stevens's some years ago, there were three examples of *brachyductyla*; Mr. Clutterbuck states he believes these were Farn's original specimen and two taken by Mr. Clutterbuck himself.

The next captures were apparently those taken by the Rev. J. W. Metcalfe and the late W. B. Davis, of Stroud—five in number—on July 15th, 1916; they were recorded in *Ent. Record*, xxviii, p. 206. In the following year Mr. Metcalfe captured and recorded in *Entomologist*, l, p. 276, four further specimens.

Following on these captures Davis found a few larvae on *Lactuca muralis*, and also bred about half a dozen imagoes from ova obtained from a captured female.

Mr. Clutterbuck first met with *brachyductyla* on July 6th, 1919,

on which day, about 7 p.m. sun time, he took a specimen at rest on a flower of the Fir rape, *Monotropa hypopitys*, apparently imbibing the juices, and subsequently captured a number of others, all either resting on or flying round the flowers of this plant, to which apparently they were attached. All these were taken between 6 and 8 p.m.

In 1926 Mr. Metcalfe found a large number of larvae on plants of *Lactuca muralis*; these were entrusted to Davis to rear. Unfortunately nearly all of them escaped from the cage in which they were kept during the ensuing winter, and were lost.

In the summer of 1928, at my request, Mr. Metcalfe kindly endeavoured to get some ova through Davis, in order that the earlier stages might be studied. Unfortunately the latter's eyesight was then failing, and Mrs. Davis, who made an expedition into *brachydactyla*'s haunts in search of ova, did not recognize them, and sent me a large consignment of *Lactuca* leaves having on them considerable numbers of ova of some insect, not lepidopterous. There were, however, on the leaves three undoubted larvae of *brachydactyla*, all of which I eventually reared to the imago stage.

In 1930 Mr. Metcalfe, being in the Cotswold district in early August, made a very successful search, and sent me a quantity of small larvae, from which there emerged last June a considerable number of imagines.

Brachydactyla is usually on the wing in the Cotswolds at the end of June and during the beginning of July; the eggs hatch about the first week in August, and the young larvae are to be found on the underside of leaves of *Lactuca muralis*. They frequent plants growing under trees in the darker parts of extensive woods. Probably the moth occurs throughout the Cotswold district, for Mr. Metcalfe has met with it in three widely separate localities, and I gather that Mr. Clutterbuck's specimens came from a fourth.

The reason of its apparent scarcity is undoubtedly its very retiring habits, respecting which we are at present largely in the dark. Mr. Metcalfe, who, so far as I know, is the only lepidopterist who has published anything on the subject, says (*Entom., l.c.*), "Whilst it probably flies after dark, it certainly has a brief flight about 7.30 p.m." As this was written in 1917 the hour would mean sun time and not summer time, and, as before stated, Mr. Clutterbuck's specimens were all taken from 6 to 8 p.m. summer time. The habit mentioned by Mr. Clutterbuck of the moth frequenting the flowers of the Fir rape is certainly remarkable. This plant is rare here, and I do not know if other species are attracted by it, but Mr. Clutterbuck informs me the only species he has seen around it is *brachydactyla*.

As regards the food-plant, it is certainly *Lactuca muralis* in the

Cotswolds, and probably in other parts of Britain, though there are two other species of British *Lactuca*, which, with certain allied plants, may perhaps furnish alternative pabulums. On the Continent it is said to feed upon *Prenanthis purpurea*, *Lapsana communis* and *Lactuca muralis*. The first of these is not a British plant, but the second is, of course, a common and widely distributed weed.

Lactuca muralis being a very local plant, I inquired from a botanist residing at Oxted if there were any plants here. I was shown two or three small ones, and was assured they were the only ones in the district; the problem of a sufficient food-supply for my larvae did not, therefore, seem an easy one to solve; but shortly afterwards, walking along the road within a hundred yards of my house, an unmistakable flowering head of *L. muralis* projected from the hedge of a neighbour's garden, and on going inside I found the plant was in such abundance as to be regarded a pest. It therefore seems possible that it is more widely spread than is generally supposed. It is, of course, not a particularly noticeable plant to a non-botanist.

I have not been privileged to see the ova of this moth, but gather they are usually deposited during the month of July on the underside of the leaves of the food-plant, usually singly, but not infrequently there are several on a leaf. The larvae hatch at the end of July or early in August. The three larvae received from Mrs. Davis in 1928 were all in the first instar at the time of arrival. The consignment received from Mr. Metcalfe in 1930 reached me on August 16th; they were all in the first or second instars. The young larva before hibernation does not eat holes in the *Lactuca* leaves, but feeds upon the lower integument only. On August 21st the majority of the larvae had ceased feeding and were preparing to hibernate on the lid of the tin box they arrived in, but some were still feeding. The whole on this date were placed upon a plant of *Lactuca muralis* growing in a large flower-pot, the top of the soil being kept about 3 in. below the top of the rim of the pot. A glass cylinder was placed on this, and above the soil the pot was filled with dead oak and beech leaves for the larvae to hibernate in. The whole was covered with a muslin sleeve and stood out in the open air, in such a position that the sleeve and its contents obtained a certain amount of moisture, but not by any means the whole of it arising out of the ensuing winter's rainfall.

At the date of going into hibernation the larvae were about 5 mm. long, and probably in the third instar; the colour was ivory white, the head being light brown and covered with long fuscous spines; shortly before this date the larvae (when feeding) were pea-green coloured on the dorsal area, the spiracular and ventral areas being of the same tint, but lighter.

On March 24th, 1931, the larvae were taken indoors ; they were still hibernating amongst the oak and beech leaves. In a flower-pot I had a plant of *Lactuca*, the growth of which had been accelerated in a warm greenhouse. This plant was enclosed in a glass cylinder, and the leaves containing the larvae placed on the soil at the top of the pot ; over the whole was fixed a muslin cover, and the cage so constituted was stood in a cool room without fire.

On April 5th a number of the larvae had crawled on to the lower stems of the plant, but apparently were not yet feeding.

On April 10th many were feeding, but some were resting on the dead leaves in the daytime, though judging by their colour—green—they had fed.

On the 18th some larvae were still resting on the dead leaves in the daytime, but the greater part of them rested on the inner side of the *Lactuca* leaf-stems, low down, apparently feeding but little, and then only at night.

After this date I was unable for about a month to make any observations on the larvae, which when next inspected, on May 17th, were nearly all full grown and preparing for the pupal change, or had actually accomplished it, but three were still feeding.

The following is a description made at this date of a full-grown larva : Length 11 mm., of average stoutness, tapering towards frontal and anal segments. Colour very light yellowish green. Along the centre of the dorsal area was a slender dark olive-green line. The segments were swollen in the centre, and the tubercles glabrous and very prominent ; each tubercle emitted several large spines. The head was the same colour as the other segments, glabrous, and having on it several dark blotches ; the abdominal area and prolegs were the same colour as the dorsal, but paler ; the spiracles were very inconspicuous.

The larvae were very sluggish, curling themselves into a ring if disturbed.

On May 31st all the larvae had assumed the pupal stage. The pupa was 8 mm. long and 1.5 mm. wide on the thorax. When newly changed the colour was dull ivory white, with a row of dark brown diamond-shaped blotches along the centre of the dorsal area ; on each side of these was an interrupted series of brown blotches, duplicated on the head. The ventral area of the abdomen, thorax and head were ivory white, and were without markings. The pupa is very spiny ; each of the tubercles, which are very prominent, emits three spines.

The larva before pupating spins a slight silken pad against the side of the breeding-cage or other flat surface, and attaches itself by the anal hooks to the pad.

In early June, having to be away from home for a time, I

handed the pupae to Mr. Metcalfe, who bred out the imagines, the whole of which emerged during the latter part of June.

It will be gathered from the foregoing that I am indebted to Messrs. Clutterbuck and Metcalfe for details of the occurrence of *brachydactyla* in Gloucestershire, and my sincere thanks are due to them, and also to Mr. H. Stringer, of the British Museum, for kindly looking up Kollar's original record and description and furnishing me with it.

Treitschke has hitherto been held to be responsible for the name *brachydactyla*; one scarcely knows why, for, as will be seen from the following translation, he does not claim it, but states that it was given by his friend Kollar:—

Systematisches Verzeichniss der Schmetterlinge von V. Kollar (= part vol. ii, *Beiträge zur Landeskunde Oesterreich's unter der Emms* [4 Band], 1832–34), p. 100 (1832):

“Size of *didactyla*, all wings black brown. The fore wings with a single split; the split does not reach the middle of the wing, therefore the lobes are short. The hind wings are split twice; the first split reaches only as far as the middle of the wing.”

Habitat: On low mountains; very rare in summer months.

Treits. Schmett. v. Eur., ix, pt. 2, p. 239 (1833):

“My friend Herr Kollar has provided a systematic list of the Lepidoptera in the Duchy of Austria and in it first made known the present species, which was found singly here, but has also been communicated to me from Saxony, where it occurs in the so-called Amselgrunde (a deep valley in Saxon Switzerland). Herr Kollar's example was in bad condition, mine is very fresh; this, and perhaps also the sex (Herr Kollar has a ♂ and I have the ♀) show a few inconsiderable differences from that earlier description. The size is like that of the aforementioned *didactyla* or a little larger. The whole body is black brown; the antennae are black, finely ringed with white; at the beginning of the abdomen there is a clear white band. The feet are very distinctly chequered black and white. The shortly-split black-brown fore wings have on the fore-margin, more or less distinct, some white spots, of which the two larger ones stand over the beginning of the split and on the fringe of the extreme tip of the wing. In the fringes of the inner margin, on the lower cilia, are again two white spots. The hind wings appear somewhat lighter brown, their fringes almost grey. They are trilobed, or twice split. The first split reaches only to the middle of the wing. Below are visible numerous white spots on a black-brown ground, as also on the fringes of the hind wings. The insect was caught on the Anninger near Mödling in shrubs in June.”

THREE MONTHS' BUTTERFLY COLLECTING IN GREECE.

BY BRIG.-GEN. C. H. C. VAN STRAUBENZEE, C.B., C.B.E.

At 5 p.m. on April 17th, 1931, the Simplon-Orient Express landed me, after an uneventful and rather tedious journey of 78 hours from London, at Bralo (the station for Delphi), on the main line from Nisch to Athens. Here, much to the amusement of the French attendant of the sleeping-car I had just quitted, I was tumultuously received by three rival motor-car proprietors, each with a retinue of sympathisers, and each, so far as I, being ignorant of modern Greek, could gather, claiming to be the chosen agent for my conveyance to Delphi. Fortunately a Greek engineer with a knowledge of German happened to be on the platform, and he, having grasped the situation, very kindly extricated me from it, re-assembled my scattered baggage, which had been forcibly borne off piecemeal to the rival cars, and soon he and I were speeding on the way to Delphi in the motor 'bus. For this only dr. 100 per passenger plus a little extra for the baggage is charged, as against dr. 500 for a car to oneself, so the saving is considerable.

Delphi was reached about 7.30 p.m., and I was soon installed in the room I had booked at the Grand Hotel d'Apollon Pythien, which is by no means so imposing as its name. The food, however, was excellent, and the staff most attentive, notably the interpreter. My bed-room was soon supplied with the extra table and chest of drawers asked for to supplement its originally somewhat meagre furniture, and I settled down to a very pleasant month's stay, marred only occasionally by the tramp of tourists, arriving or departing, sometimes in the small hours, on the bare boards of the bedrooms and corridors. Tourists of all nationalities, but mostly American and English, are numerous in the spring months, and during my stay the hotel was generally full, so it is advisable to book rooms well in advance. The charge *en pension* was dr. 220 daily. The following morning broke cold and wet, but cleared about 11.30, when I sallied forth to a collecting-ground, only a quarter of an hour's walk from the hotel, which eventually, so far as my experience went, proved the best in the neighbourhood. To reach it one goes about a mile down the main road towards Bralo, to the point where a small stream of water, emerging from a deep cleft in the red cliffs on the left, flows down to the road. On the left is a path which runs for about twenty paces alongside the stream and bends left-handed away from it, and winds, between the cliff and the ruins, back in the direction of Delphi. The first two or three hundred yards of this path produced in my case the best

results, but butterflies were to be found on the other paths radiating from it, and on the banks on either side. On this ground I took, on April 18th, several *Pieris ergane*, four *P. krueperi*, five *Anthocharis damone* and one or two *A. gruneri*, all fresh, besides commoner insects.

April 19th was a very fine, bright day, and I found *A. gruneri* females much more numerous, especially near the stream, taking about a dozen. Otherwise results were much about the same as the previous day, and continued to be so till the 23rd, when I walked towards Parnassus. This involves a steep ascent of about an hour up a good path, which brings one out on what may be described as relatively a plateau, more or less undulating, and intersected by shallow ravines. Now for the first time one sees the snow-clad peak of Mt. Parnassus in the far distance. My guide who had worked on the Panama Canal and spoke quite good English, or rather American, told me it was ten hours' march away.

Continuing our advance, the path led us, half a mile or less further on, into a shallow ravine or dry watercourse with a stony bottom, and sides covered in places with low scrub. Here *Zerynthia polyxena* and a small race of *Argynnis lathonia* were common and fresh, and there were a few male *A. gruneri*, but beyond these I saw little of interest. One continued to find these species up to, and in diminishing numbers for a few hundred yards beyond, a spring of excellent water which gushes out of the bank above the path at a point about a mile or so from where the latter debouches on the plateau. After refreshing ourselves, we continued our walk for a further two or three miles, but as we progressed found the paucity of butterflies became ever more and more marked, till eventually even the *A. lathonia*, which had persisted longer than any of the other species, ceased to appear. This confirms the experience recorded by Staudinger, of Dr. Grueper, in 1865, that "on the barren plateau of Parnassus hardly anything was to be found." The limit of our walk was a second spring, with a lake lying, as far as I remember, about a quarter of a mile to the right front of our line of advance. Here we lunched and were joined by a patriarchal looking Greek on a donkey, the only person we had seen since leaving the first spring. My guide told me that the old man was well over eighty, and was, with the exception of his son, the only permanent resident on the plateau. In that case he was a living testimony to the salubrity of the climate. I was also told that a month or so later vast flocks of sheep would be brought up to the plateau to graze, and that the sheep-dogs then became troublesome, if not actually dangerous, to the passing stranger.

I paid two further visits to the plateau on May 4th and 6th, when I found both species and individuals more numerous. Among

those taken were *Melitaea trivia* and *Carcharodus orientalis* on the way up, and on the plateau itself *P. ergane* and three specimens of a small form of *Lycaena semiargus*, resembling *montana* M.-D., and lacking any trace of the orange markings on the underside distinctive of *parnassia* Stgr.

On April 29th. on the low ground, I took the first *Papilio alexanor*, presumably var. *maccabaens* Stgr., though I can see little to distinguish it from the type. From now onwards this species became fairly numerous, though, as usual, by no means easy to catch. I also took, on the same date, a blue pronounced by Capt. Hemming to be *L. vicerama* Moore, the only individual of that or any *baton*-like species that I saw at Delphi.

On May 14th, which was the last day on which I collected at Delphi, *M. trivia* had become common and *P. alexanor* fairly so, but *P. krueperi* was getting rarer (though I did get three fresh specimens), and *A. damone* and *A. gruneri* had completely disappeared. I found, as have other collectors, that the females of these two last-named species are very difficult to get, and, despite assiduous search, I only succeeded in taking five of the former and four of the latter. Delphi in the spring is by no means a land of perpetual sunshine, and on five days of my stay collecting was rendered useless by persistently dull or wet weather.

On May 15th I left by car for Itea en route for Kalavryta. At Itea I chartered a motor-boat, at a cost of dr. 650, for the passage across the Gulf of Corinth, which took me three hours. About 11 a.m. the rising breeze made the sea decidedly choppy, as the boatmen told me it always does about mid-day, so the indifferent sailor making the crossing in a small boat such as ours may find it advisable to start in the early morning. Presumably because there is no landing-place at Diakofto, our boat was beached in a sandy cove about a mile from the railway station, to which the boatmen carried my baggage along the line, which runs all along the southern coast of the gulf to Patras.

Quite a good meal is obtainable at Diakofto Station, but on this occasion I had no time for one, as my train was almost due to start up the little mountain railway to Kalavryta, which I reached about two hours later. Through the interpreter at Delphi, who wrote in Greek (neither of the hotel proprietors I had to do with could read any other language), a room had been booked for me at the Hotel Anesis. I had been under the erroneous impression that there was only one hotel at Kalavryta, but discovered on the following morning that there was a second, the Hotel Khelmos, larger and outwardly more attractive and also possibly quieter, as it lies on the outskirts of the town. Had I foreseen what, towards the close of my stay, when the Kalavryta season was in full swing, I should

have to endure, up to the small hours of the morning, from four to five gramophones and loud-speakers in my immediate neighbourhood. I should probably have shifted to the Khelmos forthwith. As it was I remained at the Anesis for the seven weeks of my stay, and found it very clean and cheap. It came to about 8s. daily, wine and all.

For my first day's collecting, on May 16th, I went along the railway-line below Kalavryta, which runs on the right bank of a small river. This latter is spanned by two bridges, the first about one, and the second about two and a half, miles below the town, by either of which the path following the left bank may be reached. I occasionally tried this path later on, but found that I generally got better results on the railway. On this occasion I found very little flying, but took four *Lycaena helena*, which, however, was by no means numerous. I found it far commoner on the following day about half an hour's walk above Kalavryta in the open spaces in the scrub bordering the path to Sondena, but many were worn.

May 23rd was distinguished by my taking a single specimen of *Lycaena bavius* on the left-bank path below Kalavryta at a point about half-way between the first and second bridges. This experience was repeated on the 27th, when I took two (one badly damaged and released) on the railway line almost immediately opposite to the spot on the other bank where I had taken the first. So far as I have been able to ascertain, this species is new to the Kalavryta district, if not to Greece. Between May 16th and 25th I took a male and two female *Cupido sebrus* among the bushes on the left of the Sondena path half an hour's walk above Kalavryta. I may have seen others on the wing, but mistaken them for *L. helena*, which, as stated before, was common there.

On May 31st I netted my first *Colias aurorina heldreichi* only some thirty-five minutes' walk from the town, in a small ravine on the upper path to Mt. Khelmos. I never saw another in this locality, or indeed till ten days later, when I found one of its flight places on the Cherokobus plateau some thousands of feet higher up, near the tree line, and just below the easternmost peak of Mt. Khelmos. Here, on June 11th, I saw about half a dozen males, but found the species ever more and more numerous at each visit, till June 24th, when I took 12 females, and it might be described as abundant, as also, to an even greater degree, was *Parnassius mnemosyne athene*.

On a little strip of track a short distance beyond where the path from Sondena debouches on the plateau, 14 *Lycaena anteros*, some rather worn, were taken between June 14th and 24th. The best way to reach Cherokobus is by the path from Sondena, which the traveller from Kalavryta will find turning sharp off to his left as he nears the ridge overlooking Sondena. After I got to know

my way, I used to take a short cut to the left up the dry watercourse, which crosses the path from Kalavryta, after the latter makes a marked bend to the right within about a mile of Sondena. Follow the water-course and one of the sheep-tracks leading from its upper end up the hillside, until you strike into the Sondena-Cherokobus path, then follow that. The time taken by this route was roughly three hours. Cherokobus may also be reached by what I have previously referred to as the upper path to Mt. Khelmos, but this route is longer, and offers no superior advantages to the collector. In fact quite the reverse, since some of the best collecting is to be had about a mile up the watercourse traversed on the short cut previously mentioned, just before one leaves it to mount the hillside. Here at the end of June and the beginning of July there is still a little water flowing, and on patches of damp sand and mud may be found *Lycaena sephirus* and *L. admetus* in large numbers, while *L. meleager* and a race of *L. escheri* appearing to correspond with Seitz's description of *dalmatica* Spr. were occasionally to be taken. It was here, too, that, on June 28th and 30th, I was fortunate enough to take over 30 *Hesperia phlomidis*, all newly emerged. I occasionally took odd ones higher up the hill, but the watercourse seemed to be their headquarters.

It had been my intention to remain in Greece until the end of July, but a late season compelled me to stay on in Kalavryta till in early July, the heat, in spite of 2500 ft. elevation, became so unbearable that on the 9th of that month I left for Patras, and thence in a Yugo-Slav steamer up the Adriatic to Fiume on my way home.

In conclusion, and especially as that hitherto unsolved mystery, the disappearance of Mr. Cockrane, which caused much comment at the time, happened the day after my arrival at Delphi, I feel impelled to add that I never met with anything but the greatest kindness and civility from everybody I came across on my rambles. The country people were nearly always ready for a chat, but my ignorance of Greek unfortunately cramped my efforts at social intercourse except with those, by no means few in numbers, who had learned a limited amount of English while working in the U.S.A. English, indeed, seemed the most generally understood foreign tongue in the parts of Greece I visited. French, apart from the ordinary salutations, I only heard spoken by two people—one of my boatmen when crossing the gulf, and a girl on the railway-line at Kalavryta. As for German, I found nobody who responded to that language except the engineer mentioned at the beginning of this article and Dr. Karantonis and his charming wife, a German lady, the kindly companionship of both of whom relieved for me the tedium of many a long evening in Kalavryta.

The following is a list of the species taken, or observed, with localities :

D. = Delphi. K. = Kalavryta. M. = Mt. Khelmos.

Papilio machaon Linn.—Everywhere, but not common.

P. alexanor Esp.—Fairly common at D. ; some 6 only seen or taken at K. near the second bridge.

P. podalirius Linn.—Everywhere common.

Zerynthia polyxena Schiff.—D., common.

Aporia crataegi Linn.—K., very common mid May to mid June.

Pieris brassicae Linn.—Everywhere.

P. krueperi Stgr.—D., fairly common.

P. rapae Linn.—Everywhere, but rare at K. and M.

P. manni Mayer.—D., common.

P. ergane Geyer.—Everywhere, but common only at D.

P. napi Linn.—Rare at D. and K.

(To be continued.)

VANESSA ANTIOPA IN BEDFORDSHIRE.—On May 18th at about 12.30 p.m. I was fortunate enough to capture a female of this species. It was about my garden for nearly two hours, and after missing it twice I eventually succeeded in taking it in the field just outside the garden. The wings on the right side were rather chipped, especially the hind wing. I am keeping it for ova on the off-chance that it has come from the Continent this spring and so may be fertile, but fear that if it has hibernated here then the chances of this are remote.—ALFRED V. HEDGES, F.E.S. ; Milton Ernest House, Milton Ernest, Beds, May 21st, 1932.

LONGEVITY OF CYNIPID LARVAE.—Twenty acorns of *Quercus cerris*, L. (the Turkey Oak), containing larvae of the gall wasp *Callirhytis glandium*, Gir., were collected on October 26th, 1926, at Limpsfield, Surrey. From these galled acorns the imagines have emerged as follows : 1 on March 29th, 1928 ; 2 on March 24th, 1929 ; 7 on March 27th, 1930 ; 29 during April, 1930 ; 32 in April, 1931 ; and 16 in April, 1932. This species is known to remain in the larval stage for a very long period, but as far as I am aware, five years is the longest time previously recorded.—M. NIBLETT ; 10, Greenway, Wallington, Surrey.

REDISCOVERY OF ALLODAPE PUNCTATA (LEP. AND SERV.).—In the *Entomologist*, January, p. 10, I told of finding the *Scapter punctata* of Lepeletier and Serville in the Paris Museum, and redescribed it under *Allodape*. It was represented by a single specimen from Caffraria. It is of interest to note that the species was rediscovered by Miss Alice Mackie at Doorn River, near Camfer, Cape Province, November 3rd, 1931.—T. D. A. COCKERELL ; Boulder, Colorado.

TWO NEW HEMEROBIIDAE (NEUROPTERA).

By D. E. KIMMINS.

Symphorobius notatus, sp. n.

♂. Yellowish, marked with brown and black, clothed with fine yellow hairs. Head brown on the genae, antennae with the first two joints brown. Eyes dark grey. Prothorax transverse, brownish, paler in the centre, the lateral margins light yellow, anterior margin convex. Mesothorax with the humeral angles dark brown and the hinder portion black. Metathorax dark brown with two pale spots. Abdomen yellowish brown. Superior appendages rounded, each bearing at its apex a slender spine, curved inward at the tip. Seen from the side, this spine is truncate, its lower angle being produced to form a tooth. Subgenital plate from above about twice as long as broad, its apex rounded, lateral margins with a shallow excision. From the side both the upper and lower margins are convex.

Anterior wing about two-and-a-quarter times as long as broad, the apex obtusely rounded. Membrane hyaline, venation pale, marked with brown as follows: a distinct spot around the cross-vein between the subcosta and radius in the basal half of the wing, the outer cross-vein between the first and second radial sectors, and the cross-vein between the upper and lower branches of the cubitus. Most of the remaining cross-veins and some of the outer forks are shaded with brown. In the ♂ paratype, the anal area of the wing is strongly marked with brown. Costal area broad, costal cross-veins forked for about half the length of the costal area. One cross-vein in the apical field of the wing, five veins in the gradate series.

Posterior wing about two-and-a-quarter times as long as its greatest breadth, which occurs in the apical third; hyaline, venation pale. Two branches to the radial sector, two cross-veins in the centre of the wing.

Length of anterior wing, 4 mm.; of posterior wing, 3.25 mm.; of body, 2.5 mm.

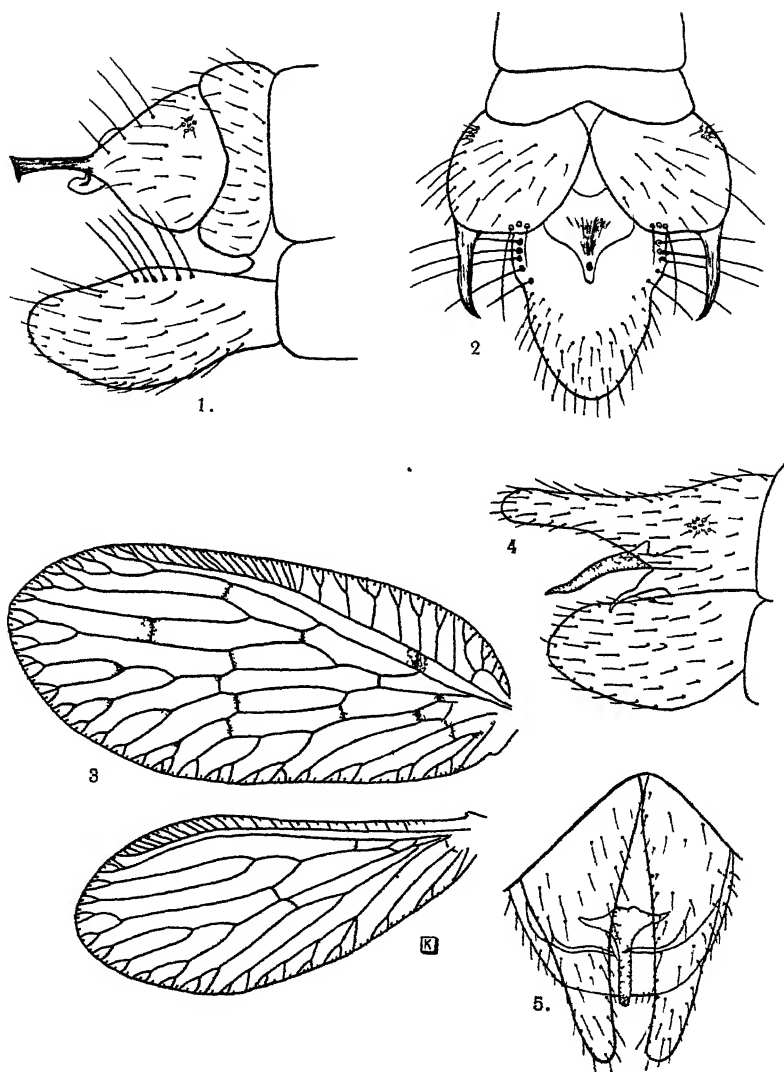
West Indies, St. Vincent, Windward Isles (H. H. Smith).

1 ♂, type (right wings and abdomen preserved as microscope preparations); 1 ♂, paratype, in the British Museum Collection.

This species might be confused with *S. intervenalis*, Bks., from Colombia, but Dr. N. Banks, who has kindly compared a figure with his type (a female), writes that it differs in the number and placing of the gradate veins, and in the markings of the wings. In *intervenalis* there are the usual four cross-veins in the apical field of the anterior wing, each heavily marked with brown.

Nesomicromus marquesanus, sp. n.

Body dark brown, clothed with sparse golden hairs. Eyes dark, globose and prominent. Antennae darker than the head, moniliform; basal joint large, subcylindrical. The thorax is broader than long,



FIGS. 1-3.—*Sympherobius notatus*, sp. n., ♂. 1, Genitalia from side; 2, genitalia; 3, wings.

FIGS. 4, 5.—*Nesomicromus marquesanus*, sp. n., ♂. 4, Genitalia from side; 5, genitalia from above.

with a sinuate transverse furrow before the middle. Legs paler. The superior appendages triangular, the apex of each produced to form a blunt point. From the lower basal margin there arises a slender sinuate spine, about one-half the length of the appendage, curving inwards and slightly downwards. Median appendage sinuate, reaching as far as the apex of the subgenital plate, and on its upper surface near the base expanded upward and outward to form two small triangular lobes.

Anterior wing elongate, rounded at the apex; membrane brownish hyaline, somewhat corrugated between the veins, which are yellowish, and marked with brown. Gradate series clouded with brown. Costal area narrow at the base and then strongly dilated. Eight radial sectors, the apical sector bearing one branch. Median fork basad to that of the cubitus. Eight veins in the inner, and twelve in the outer, gradate series.

Posterior wing elongate, broadest beyond the middle, its apex somewhat acute. Membrane hyaline, with pale veins. One false origin to the radial sector, which bears four branches. The gradate veins number four in the inner, and ten in the outer, series.

Length of anterior wing, 8.5 mm.; of posterior wing, 7 mm.

Marquesas Is., Hiva-Oa, January, 1925 (L. E. Cheesman), 1 ♂, type; 1 ♀, 1 ♀, paratypes.

Marquesas Is., Tahuata, January, 1925 (L. E. Cheesman), 1 ♀, paratype, all in the British Museum Collection.

It is possible that, at some future date, it may be found necessary to remove this species from the genus *Nesomicromus*, of which all other known species are restricted to the Hawaiian Islands. The genus contains many forms differing considerably in appearance and venation, and therefore I prefer to consider the Marquesan species as a *Nesomicromus* until such time as it may be possible to examine the genus critically. The general structure of the ♂ genitalia of *N. marquesanus* is clearly related to that of *N. vagus*, Perk., the genotype.

16, Montrave Road,
Penge, S.E. 20;
June 13th, 1932.

ANAPHAIS (PIERIDAE) IN NEW CALEDONIA.—When in New Caledonia in 1928, I obtained specimens of *A. peristhene*, Boisduval, described from that island. I have a female from Bourail, May 21st, and a male from Charron Island (one of the small islands off the coast), June 5th. In Seitz' *Macrolepidoptera* the account of this insect is misleading. *A. peristhene* is called "a more melanic summer form," with no hint of its locality. The figures purport to represent male and female, but Capt. Riley writes me that the supposed female is certainly a male. The female has the basal part of the upper wings more decidedly yellowish and the black on the hind wings is more extensive.—T. D. A. COCKERELL.

NOTES AND OBSERVATIONS.

FURTHER BRITISH CAPTURES OF PHLYCTAENIA FULVALIS HB.—The only recorded British example of this Pyralid so far seems to be the one taken near Bournemouth on August 8th, 1927, by Mr. C. Granville Clutterbuck, and recorded by him in the *Entomologist* for April, 1930, p. 85. My friend Capt. C. Diver and his son have in the last few years begun to form a collection of "micros," and having accumulated a few difficulties, asked me to see if I could solve them. The first of these was a series of some 14 Pyralids, which could not be placed. I saw at once that these were *P. fulvalis*, Hb., with which I am well acquainted from foreign specimens in Mr. W. Fassnidge's collection. The moths were taken on different occasions at light in South Dorset in July, 1930, and August, 1931; Capt. Diver informs me that he could have taken several more, but he put them down as *P. ferrugalis*, which was also flying at the time, and did not perceive he had two species till he sorted them out this autumn. These extensive further captures are most reassuring as to the British status of *fulvalis*, as the impression I derived from the note on the insect by Mr. Edward Meyrick, F.R.S., which was included in Mr. Clutterbuck's record, was that there was a chance that the specimen might have been accidentally imported with some garden *Salvia*. As other collectors may possibly possess specimens overlooked in their cabinets I think it well to stress that, in spite of the closely parallel markings, as pointed out by Mr. Meyrick and well shown by the figures in the *Entomologist* for June, 1930 (Plate III, figs. 5 and 6), *fulvalis* superficially bears little resemblance to *prunalis*. The sandy ground-colour gives it, at a first glance, a much closer likeness to *P. crocealis*, or *P. ferrugalis*, for which Capt. Diver, who is an accomplished all-round naturalist, at first took it.—H. C. HUGGINS; 5, Windsor Avenue, Cliftonville, Margate.

CAPTURES IN 1931: LEPIDOPTERA.—Last year, for all its chilly and wet disappointments, yielded some interesting results. I took, late in June, 6 *Pancalia latreillella* in an open space in a wood in mid-Sussex where *Oxyptilus heterodactylus (teucarii)* occurs, though sparingly; on a common nearby I took, also in June, 7 *Hemimene alpestrana*, all females. All of these have been submitted to Mr. Meyrick, and the latter, at his suggestion, also to Mr. Pierce.

Though I have never taken *Stomopteryx vinella* in Mr. Vine's original locality, I found it sparingly both last year and the year before in a rough field near Lewes among its food-plant (*G. tinctoria*). In 1929 I took two specimens which I supposed were strongly spotted *vinella*, but having since taken the true form, I sent these two to Mr. Meyrick and he has identified them as *S. sangiella*; this discloses an interesting extension of habitat for this species. hitherto, I believe, not known to occur in Britain except in Durham.

In Avonside, Banffshire, also in 1931, I took a few insects which may be worth recording. *Polia riminalis* varied from almost normal to practically complete black. *Eupithecia sobrinata* gave very strongly marked specimens, some with quite white median markings.

Lithocolletis spartifoliella was fairly common but wasted (end of July). I was surprised to take *Tortrix viridana* and *Argyresthia albistria* so far north.—A. F. GRIFFITH; April 22nd, 1932.

MISIDENTIFICATIONS OF MICROLEPIDOPTERA.—During the last few years I have seen on more than one occasion *Micropteryx purpurella* from Rannoch sold at Stevens's Auction Rooms as *M. caledoniella*. I took my *M. caledoniella* in Strathnaver, Sutherland, and distributed none except two that I gave to Mr. Stainton and two to Mr. Vine. Mr. Pierce has kindly examined my specimens and finds them to be indistinguishable from *M. sparmannella*, and though he points out that the genitalia of *Micropteryx* are not very readily distinguishable, he feels certain that *caledoniella* should be sunk as a synonym of *sparmannella*, certainly not of *purpurella*. I took one specimen of what both Mr. Stainton and I recognized as *sparmannella* in Strathnaver when I took the others.

I have seen a specimen of *Crambus verellus* wrongly labelled as received from me. I took five specimens in all, at Haslingfield, near Cambridge. Four of these are in my collection at Cardiff; the fifth, a wretched specimen, I gave to Mr. Hodgkinson at his urgent request, though I was ashamed to pass on one so utterly worn. Perhaps I ought to add in this connection, that I bought a small collection of Lepidoptera caught at Bognor, Sussex, including the *Crambus verellus* recorded from that locality. This specimen Mr. W. H. B. Fletcher accepted for his splendid collection. It is in good condition.—A. F. GRIFFITH; 3, Evelyn Terrace, Brighton.

IMMIGRANT LEPIDOPTERA: S.E. UNION OF SCIENTIFIC SOCIETIES' IMMIGRATION RECORDS SCHEME.—The following records from West Sussex, South Hants and Isle of Wight have so far reached me:

Colias croceus. Four. One at Littlehampton, 18.vi.32 (Major H. C. Jeddere Fisher).

Vanessa atalanta, L. One specimen flying, Bognor Park, Sussex, 12.vi.32 (A. H. Sperring).

V. cardui, L. One specimen in good condition flying near Southampton, 31.v.32 (W. Fassnidge). Seen at Littlehampton, Sussex, 22.iv.32 and 17.v.32 (Major H. C. Jeddere Fisher). One specimen seen at Burton Common near Christchurch, 12.vi.32 (Dr. B. N. Blood).

Acherontia atropos, L. One specimen on a ship from the Baltic which had been in port for three days at Littlehampton (Major Jeddere Fisher).

Macroglossa stellatarum, L. One at Littlehampton, 18.vi.32 (Major H. C. Jeddere Fisher).

Plusia gamma, L. Two specimens near Southampton, 22.v.32; one specimen near Southampton, 31.v.32; odd specimens have since been seen in the New Forest and in other localities near Southampton, about ten in all (W. Fassnidge). One specimen netted at dusk on Portsdown Hill, near Portsmouth, 7.vi.32 (A. H. Sperring). Seen commonly, five or six in a space 12 ft. square, right on the coast at 10 a.m., in bright sunshine, wind south, 12.vi.32 (Major

Jeddere Fisher). Five specimens seen on Chewton Common and at Highcliffe, Hants, 13.vi.32 (Dr. B. N. Blood).

Nemophila noctuella, Schiff. Some six specimens kicked up from grass at Mudeford, near Christchurch, 1.vi.32 (A. Druitt).

Plutella maculipennis, Curt. Four specimens taken in an alder swamp in the Great Cover, Baddesley, near Southampton, and two in a field nearby; wind light, southerly, 15.v.32; four specimens at Swaythling, near Southampton, 19.v.32; two specimens on Southampton Common, 20.v.32; occasional specimens have been seen since in many localities in the New Forest and near Southampton, about thirty in all (W. Fassnidge).—W. FASSNIDGE (Recorder); 47, Tennyson Road, Southampton, June 15th, 1932.

FURTHER IMMIGRANT RECORDS.—At Mr. Adkin's meeting of the Entomological Club at Eastbourne, on May 28th, Mr. Tomlin found a *Pyrameis cardui* and Mr. Hugh Main a *Nemophila noctuella* on the Crumbles. At Battle E. Sussex, the first *V. atalanta* captured was a female on May 15th, at rest on a lawn. From the Isle of Wight Mr. A. Howard Greenham writes that *P. cardui* were flying about in dozens during the middle of May on the downs between Niton and Blackgang; both sexes were present and in very good condition; they were especially numerous in the neighbourhood of thistles; during June the numbers decreased, and on June 13th in three hours only ten were seen.—T. DANNREUTHER (Capt. R.N.); Windycroft, Hastings (Hon. Organizing Secretary, S.E.U. Sci. Soc.'s Immigration Records Scheme).

LOCAL SCARCITY OF *VANESSA URTICAE*.—During the whole season of 1931, in many districts widely separated throughout the country, *V. urticae* was unusually scarce where it normally occurs in abundance. Lord Rothschild tells me he saw less than half-a-dozen specimens last summer and autumn on the *Buddleias* in Tring Park, which usually attract this butterfly in abundance. Also I hear from Capt. E. B. Purefoy that he did not see a single specimen of *urticae* throughout the whole of last year in his gardens in Kent. Baron Bouck, too, noticed the same scarcity in his gardens at Godstone, Surrey, where he only saw nine specimens on the *Buddleias*, which are usually "alive with them." In various parts of Kent, Surrey, Sussex and Hants that I visited at different times last year, I only met with less than half a dozen individuals. As many examples of *urticae* enter into hibernation shortly after emergence in the summer, and as such unfavourable weather prevailed in most parts during last July and August, the majority of specimens may have hibernated at once, which may perhaps explain the general scarcity last season. This supposition is strengthened by the fact that many hibernated examples were recently seen by Capt. N. D. Riley in West Sussex. That *urticae* sometimes goes into hibernation very early is shown by the following observation: In 1918 I had a specimen which entered into hibernation in my house about the middle of July, and remained motionless until the end of the following March, when it awoke after its eight and a half months' torpidity; and other similar observations

have been recorded. I hear from Major Chavasse that at Skibbereen, co. Cork, last year was "a great year for the *Vanessas*, particularly *atalanta*, *cardui*, and in a lesser degree *io*, and of course *urticae*, of which there is always a good show."—F. W. FROHAWK; May, 1932.

MAY EMERGENCES.—The cold weather of April continued till May 10th. From May 11th to 22nd day temperatures were about normal, from 23rd to 31st below normal. These two periods were marked by heavily excessive rainfall and deficiency of sunshine. Nights, generally, were fairly mild. Flowering trees and shrubs are very backward, herbaceous growth less so. A few of the overdue April species appeared during the mild mid-May period. *Anticlea nigrofasciaria* on May 10th; *Hemerophila abruptaria* the next night; *Lampropteryx suffumata* on the 17th. A peculiarity of the season was the simultaneous first appearance, on May 22nd, of *Cucullia verbasci*, a month late, and of *Spilosoma menthastris*, rather early. Of the normal May emergences the most notable were *Diaphora mendica* (10th); *Nola confusalis* (19th); *Notodonta trepida* and *Dasychira pudibunda* (20th); *Odontopera bidentata* (11th); *Eucoxia certata* and *Gymnoscelis pumilata* (14th); *Selenia tetralunaria* and *Chesias rufata* (15th); *Lobophora viretata* (19th); *Chloroclystis coronata* (20th). It is naturally a late season for the early summer Noctuas. They made a half-hearted start on May 28th with *Mamestra thalassina*, followed the next night by *Abrostola tripartita*. Sugar proved ineffective throughout the month. I was informed that a number of diurnal fliers were seen in a Wyre Forest clearing on May 31st—a sunny day. A day or two later I verified that *Ematurga atomaria* and *Venilia maculata* were on wing in abundance. Altogether during May I recorded the first appearance of only twenty-eight species of Heterocera, excluding micros.—E. P. WHITCOMBE; Bewdley, Worcestershire, June 9th, 1932.

INSECTS IN DEAD RAGWORT STEMS.—In the year 1902 Giard described as *Sciara medullaris* a dipterous larva which was said to be common in spring in dead ragwort stems on the sandhills near Wimereux (N. France), a very remarkable feature of this larva being its power of reviving after more or less complete desiccation. Giard's observations have never been confirmed, nor has the adult of *S. medullaris* ever been described. My attention having been called to the matter by Dr. P. A. Buxton, I collected a large bundle of dead ragwort stems on the sandhills near Blakeney Point in April last. No trace of any *Sciara* larva could be found, but the other insects obtained may be worth recording. More than half the stems examined had been tunnelled by larvae of *Agromyza aeneiventris*, Flu., the pupae of which were found in the stems, usually near the base, and usually only one or two in each stem. Two Hymenopterous parasites were reared from pupae of this fly—the Cynipid *Gronotoma ? nigricornis*, Kieff. (det. H. Scott), and the Chalcid *Syntomopus ? thoracicus*, Walk. (det. C. Ferrière); the former of these has already been recorded from the same host from the same district (see *Ent. Mo. Mag.*, 1921, p. 186). No other Diptera were found, but a few

stems had been tunnelled by a small moth (probably a *Depressaria*, det. H. Stringer), most of the larvae of which had evidently fallen victims in the autumn to a Braconid, the parasite's cocoons lying transversely to the stem in a space which had been prepared by the moth larva for pupation. In two instances bright red immature Thysanoptera (*Bagnallia*, sp., det. F. Laing) were found feeding on the remains of the moth larva.—F. W. EDWARDS; British Museum (Nat. Hist.), S.W. 7.

THE FEMALE OF SPANIOTOMA (ORTHOCLADIUS) FLEXUELLA EDW.—As this species has been made the type of the new subgenus *Pseud-orthocladius* Goetghebuer, it may be as well to record the characters of the hitherto unknown female. I found the species to be common near the top of Pen-y-Ghent, Yorks, at the end of June, 1930, both sexes being collected. The female resembles the male in having the thorax wholly black, with the mesonotum shining, but differs in having the wings milk-white at the base only, most of the membrane being rather smoky. The antennae are remarkably long for a female Chironomid, being almost as long as the thorax; 6-segmented, the five flagellar segments nearly cylindrical and subequal (2-4 very little shorter than 1 and 5), without sense-bristles. These features of the female antenna support the retention of a special section of *Orthocladius* for this species alone.—F. W. EDWARDS.

AN EARLY DRAGONFLY.—I saw a green dragonfly hawking over the water of Fetcham Pond near Leatherhead on April 18th at 8.30 a.m. The insect flew past me, going northwards, then turned out over the water and back again disappearing round the south end of the island. Coots and little grebe are sitting earlier this year than they did last, and it is suggested that the temperature of the water is above normal, never having been properly chilled during the winter. If this explanation is correct it may account for the appearance of the insect, though the time it selected was hardly suitable—a cold north wind neutralizing the bright sunshine.—HAROLD J. BURKILL; 3, Newman's Court, Cornhill, E.C. 3, April 19th, 1932.

PYRAMEIS CARDUI AT BEXLEY, KENT.—This afternoon, May 23rd, 1932, one of our assistants captured a very worn and faded *cardui* in the grounds of my butterfly farm. It was flying feebly amongst a plantation of young fennel. It will be interesting to hear if any other specimens are reported, and if there has been an extensive migration of this species at such an early date and during such unsettled weather.—L. HUGH NEWMAN and L. W. NEWMAN; 42, Salisbury Road, Bexley.

FIFTH INTERNATIONAL CONGRESS OF ENTOMOLOGY.—Readers are reminded that there is still time to make arrangements to attend this Congress, which meets in Paris this year, July 16th to 23rd. Full particulars are to be obtained from Dr. Karl Jordan, the Permanent Secretary, Zoological Museum, Tring, Herts; and excellent travelling facilities and hotel accommodation are provided by Messrs. Thos. Cook & Son, Ltd.—ED.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 4th, 1932.*—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Obituary.*—The death of Mr. J. C. Robbins, a Fellow of the Society, was announced.—*Exhibits.*—Mr. O. W. Richards exhibited and gave an account of a long-lived Mutillid. Dr. G. D. H. Carpenter exhibited and gave an account of some mimetic Lycaenids and their models from Lake Victoria. Capt. A. F. Hemming, C.B.E., described two recent additions to the butterfly fauna of France (*Argynnis aphirape* and *Heodes amphidamas*). Mr. H. St.J. K. Donisthorpe made remarks on some rare insects from Windsor Forest. Dr. F. W. Edwards described (1) a little-known Chironomid fly (*Spaniotoma curtica* Edw.) captured by an Empid (*Tachydromia* sp.), (2) an unusual type of intersex in a Chironomid fly, (3) the occurrence of *Medetera obscura*, Zett., in Windsor Forest (Diptera, Dolichopodidae). Prof. E. B. Poulton, F.R.S., gave an account of (1) a remarkable variation of ♀ *Hypolimnas misippus*; (2) a Noctuid caterpillar found in a tomato believed to have come from Teneriffe; (3) Mr. W. W. A. Phillips' experiments in feeding a Ceylon lemur with Lepidoptera; (4) two interesting ants from the Belgian Congo, described by Miss Vinall. Mr. B. M. Hobby gave notes on further records of sawflies and their prey.

Wednesday, June 1st, 1932.—Dr. H. Eltringham, F.R.S., President, in the Chair.—*Election of Fellows.*—The following were elected Fellows of the Society: Hugh Trelawny Pagden, M.A., Department of Agriculture, S.S. and F.M.S., Kuala Lumpur, F.M.S.; Donovan Reginald Rosevear, Forestry Department, Enugu, S. Nigeria; André Ch. Théry, 21, Avenue de la Victoire, Rabat, Morocco.—*Exhibits.*—The Hon. Secretary, on behalf of Mr. A. M. Altson, read notes on the habits of *Ochromyia depressa*, R.-D., and *O. peuhii*, B.-B., in Northern Rhodesia. Mr. H. St.J. K. Donisthorpe exhibited and described some rare insects from Windsor Forest. Mr. H. S. Leeson made remarks on the sex of newly-emerged fleas (*Xenopsylla cheopis*). Mr. O. W. Richards exhibited and made remarks on (1) some insects bred from fungus in Windsor Forest, (2) some flies bred from rotten wood in Windsor Forest. Dr. F. Morton Jones gave an account, with lantern-slides, of insect coloration and the relative acceptability of insects to birds. *Papers.*—The following papers were read: A Contribution to the Study of the Genera *Ephestia* and *Plodia*, by O. W. Richards and W. S. Thomson; A Revision of the Ethiopian Species of the Genus *Apanteles*, by D. S. Wilkinson; *Acraea johnstoni*, Godm., Its Forms, and Their Geographical Distribution, by G. D. Hale Carpenter; The British Tachinidae, 1st Supplement, by C. J. Wainwright; Insects for Human Consumption in Siam, by W. S. Bristowe; The Butterflies of Transjordan, by A. F. Hemming; Insect Coloration and the Relative Acceptability of Insects to Birds, by F. Morton Jones.—S. A. NEAVE, *Hon. Sec.*

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A NEW EXPLANATION OF THE GENETICS OF SEX-LIMITED INHERITANCE IN BUTTERFLIES.

BY E. A. COCKAYNT, D.M., F.R.C.P.

It is well known that in nearly every species of the genus *Colias* there is a white form limited to the female sex. The ab. *helice*, Hbn., using the name to include ab. *pallida*, Tutt., and ab. *helicina*, Oberth., of *C. croceus*, Fourcr., is the most familiar example. *Dryas paphia*, L., has a sex-limited form, ab. *valesina*, Esp. The sex-limited forms have been shown to be dominant to the typical male-like forms in all the cases that have been fully investigated, and it has also been found that the males of the species concerned can transmit the coloration peculiar to the opposite sex. Many broods have been reared in this country from captured *helice* females, and have always produced *helice*, as a rule with an equal or nearly equal number of orange females, but all the males have been typical. The presumption is that *helice* is dominant to the type. Gerould, in America, has carried out experiments on a small scale with *C. eurytheme*, Bdv., and its white female ab. *albina*, and on a much larger scale with *philodice*, Godt., and its white female, ab. *alba*, Stdgr. From a number of white females of *eurytheme* he got 333 males, 192 white females, and 173 yellow females, and from white females of *philodice*, 894 males, 343 white females, and 366 yellow ones. In the earlier experiments with *philodice* in broods of which both parents were believed to have been heterozygous for white he got a ratio of 2 : 1 white to yellow females, instead of the expected ratio of 3 : 1, and he attributes this result to a lethal gene which destroys both the males and females homozygous for white. In later experiments the lethal gene was eliminated, and he got the expected 3 : 1 ratio from crosses of this kind. One large brood, of which both parents were heterozygous, gave 253 imagines, 130 males, and 123 females, 95 white and 28 yellow. On expectation a quarter of the white females were homozygous for white, and crosses were obtained between white females of this brood and their brothers, which gave all yellow males and all white females, and these crossed *inter se* gave the same result again in the next generation. Some of these yellow males and white females must have been homozygous for white. Other experiments confirmed him in the belief that he had bred both males and females homozygous for the white colour, but all the males were yellow.

Goldschmidt and Fischer carried out experiments with *Dryas paphia* and obtained results similar to those of Gerould with *Colias*. When only one parent was heterozygous for *valesina* they got equal numbers of typical and *valesina* females, but at first they were troubled by a lethal gene, and when both parents were heterozygous, they got a ratio of 2:1 *valesina* to typical females. Later on, however, the expected 3:1 ratio was obtained. One such brood gave 107 males and 103 females, 73 *valesina* and 30 *paphia*. Two pairings of normal *paphia* females and males of this brood gave 76 males and 105 females, all of which were *valesina*. These results show that *valesina* is dominant, that both males and females homozygous for the *valesina* colour are viable, and that males, even when homozygous for *valesina* colour, are indistinguishable from typical *paphia*. This is confirmed by the fact that in the eastern part of its range all the females are *valesina*, and, though presumably all the males in the same district must be homozygous for the *valesina* colour, they are all typical.

These results show that the sex-limited colour cannot be dominant in the female, manifesting itself both in the heterozygous and in the homozygous state, and recessive in the male, manifesting itself only in the homozygous state, though this was at one time believed to be the explanation. This kind of inheritance is known in sheep: in certain breeds the rams are horned, even when they are heterozygous, but the ewes are horned only when they are homozygous for the dominant gene determining the presence of horns.

Goldschmidt explains the sex-limitation by saying that at the moment of development of wing pigment, when a sex-limited gene is about to play its part, differentiation in the male has already reached a point at which no further change is possible.

Differentiation in the female, on the other hand, is not yet so far advanced, and the organism is therefore susceptible to the action of the genetic factor. If this were so, one would expect intermediate males to appear when development was slowed down by a low temperature, and one would expect to find some gynandromorphs with both sides of sex-limited coloration, for some of them must be genetically alike on the two sides, if Goldschmidt's view is correct, and the rate of development would be the same on both male and female sides in a gynandromorph. Actually no such gynandromorph has been recorded, though a number are known with both sides normal, or with the female side of sex-limited coloration.

It is probable that *Papilio glaucus*, L., which has a yellow male-like female, *turnus*, L., and a black sex-limited form, *glaucus*, L., is another example of the same type of inheritance. In the northern part of its range all the females are male-like, while in the southern

and south-western part the black form predominates. Edwards says that the progeny of black females are all black, or that a few are yellow and the majority black. Unfortunately his broods were small and were not kept separate, so that the data are insufficient to prove that black is a simple dominant to yellow.

In Lepidoptera the female has dissimilar sex chromosomes, W and Z, while the male has two similar ones, ZZ, and this seems to me to afford the clue to this kind of sex-limited inheritance. If there is an autosomal dominant gene for the sex-limited colour, and it can only produce its effect in the presence of an activating gene in the W-chromosome, the theoretical results agree with those actually obtained. It must be assumed that the activating gene is present in the W-chromosome of every female of the species. Males, whether heterozygous or homozygous for the dominant gene in the autosomal chromosome, cannot develop the colour determined by it, because they have no W-chromosome, and therefore no activating gene. Using the symbol D for the autosomal dominant, R for the corresponding recessive gene for the normal colour, and A for the activator in the W-chromosome the following matings are possible :

(1) Between a normal male and a female heterozygous for the sex-limited colour and therefore showing it, and between a male, apparently normal, but heterozygous for the sex-limited colour and a normal female—

$$ZZRR \times Z(WA)DR \text{ and } ZZDR \times Z(WA)RR,$$

which gives progeny in the following ratio :

ZZRR : ZZDR : Z(WA)RR : Z(WA)DR—one normal male, one apparently normal male heterozygous for the sex-limited colour, one normal female, and one female with the sex-limited colour.

(2) Between two parents both heterozygous for the sex-limited colour, but only the female showing it—

$$ZZDR \times Z(WA)DR,$$

which gives—

1 ZZRR : 2 ZZDR : 1 ZZDD : 1 Z(WA)RR : 2 Z(WA)DR : 1 Z(WA)DD—four males all normal in appearance, but two heterozygous and one homozygous for the sex-limited colour, one normal female and three with the sex-limited colour, two heterozygous and one homozygous.

(3) Between two parents, one heterozygous and the other homozygous for the sex-limited colour—

$$ZZDD \times Z(WA)DR \text{ or } ZZDR \times Z(WA)DD,$$

which gives—

ZZDD : ZZDR : Z(WA)DR : Z(WA)DD—two apparently normal males and two females with the sex-limited colour.

(4) Between two parents, both homozygous for the sex-limited colour—

$$ZZDD \times Z(WA)DD,$$

which gives equal numbers of males and females like the parents, the males apparently normal and the females with the sex-limited colour.

On this hypothesis males with the sex-limited coloration cannot be produced unless some abnormal occurrence takes place during cell-division. Male *helice* and male *valesina* have been recorded, but I feel sure that some of them are not really *helice* or *valesina*, but that the unusual colour is due to a defective development of the scales. The males simulating *helice* probably have very thin scales rolled up and devoid of pigment, and those simulating *valesina* have thin scales curled up at the edges, and containing a deficient amount of pigment. Unfortunately I have never had an opportunity of examining one of them under the microscope, but I have seen other species with an alteration of colour caused in this way, and I have examined males of *paphia* with patches of so-called *valesina* colour, in which the abnormality was due to defective scales. Fischer, in 1929, was able to collect records of eight reputed *valesina* males, but some are very doubtful. Goldschmidt considers that white males of *Colias* do exist, and that they are mutants genetically unrelated to the white females, but, if there are true *valesina* males as well as white males of *Colias*, it is more likely that both are examples of the sex-limited colour appearing in the male sex.

If so they could be produced in two different ways: Crossing over might take place between the Z and W chromosomes, so that the activating gene in the W was transferred to the Z, and some of the genes in the Z to the W. In this way an insect constituted Z(ZA)DR might be produced, and it would be male because of its two Z-chromosomes, and of the sex-limited colour because of having both the dominant autosomal gene D and the activating gene A. Fraser and Gordon explain a case of anomalous inheritance in the killifish, *Platyepcillus*, in this way.

They might also arise by non-disjunction, two Z-chromosomes and a W entering one nucleus of a germ-cell, and only a W the other. This so-called chromosome aberration may be due to two Z-chromosomes becoming entangled and failing to separate in time for one to reach each nucleus. It has been proved to occur in *Drosophila*, both by breeding and by cytological examination. In this way an insect constituted ZZ(WA)DR might be produced, and would be male, because it had two Z-chromosomes, and would be of the sex-limited coloration, because it had both the autosomal dominant gene D and the activating gene A. Both these occurrences must

be very exceptional, but, if genuine examples of male *helice*, *valesina*, or other sex-limited female forms occur at all, they, too, must be very exceptional.

Gynandromorphs, half *croceus* male and half *helice* female, or half *paphia* male and half *valesina* female, and similar gynandromorphs of other species have been caught, though very seldom. These cannot arise by the loss of a Z-chromosome, as some gynandromorphs arise, because there would be no activating gene to aid the autosomal dominant. There is, however, ample proof that lepidopterous gynandromorphs sometimes originate from a binucleate ovum, each nucleus being fertilized by a different spermatozoon, and this might result in an insect half typical male and half sex-limited female.

Somatic mosaics of *croceus*, half typical female and half *helice* female, are known, and there is one such mosaic of *Papilio glaucus* figured by Edwards, half *turnus* female and half *glaucus* female. These might originate in the same way from binucleate ova or by somatic mutation.

The hypothesis explains in a simple way all the results obtained by extensive breeding experiments, and accounts for the exceptional males with sex-limited coloration and for the gynandromorphs and mosaics, which show both sex-limited and typical coloration in the same insect.

Sex-limitation in some species of *Papilio* is more complicated. *P. polytes*, L., has three forms of female, which are found together—*cyrus*, Fabr., resembling the male, *polytes*, L., resembling *Pharmacophagus aristolochiac*, L., and *romulus*, Cram., resembling *Pharmacophagus hector*, L. Fryer, in his breeding experiments, was able to extract *cyrus* in a pure strain, but failed with both the others. *Cyrus* appears to be recessive to both mimetic forms, and *polytes* to *romulus*. He suggests in his paper that there is a dominant autosomal gene determining the *polytes* pattern, and a second dominant autosomal gene, which in the presence of the first alters the *polytes* to the *romulus* pattern. Males may be constituted like all the female forms except that there is a dominant inhibiting gene in the heterozygous state, intimately connected with the factors, which may be supposed to produce the male sex. He assumes that there is a repulsion between this inhibitor and the factor responsible for making an insect a female. This was written before the mechanism of the sex chromosomes was known. Using a more modern terminology, he supposes that there is repulsion between a germ-cell with the inhibiting gene in one of its autosomes and a germ-cell with a W-chromosome, but there is no evidence that repulsion of this kind ever takes place. That the inhibiting gene is intimately connected with the factors which determine the male

sex is impossible, because it would mean that it is in the Z-chromosome, and Z-chromosomes are common to both sexes.

He gives the constitution of the various males and females as follows, using P for the inhibitor and p for its recessive allelomorph, H for the dominant gene determining the *polytes* pattern, and R for that determining the *romulus* pattern in the presence of H, and h and r for their respective recessive allelomorphs:

Males.	<i>cyrus.</i>	<i>polytes.</i>	<i>romulus.</i>
Pp \overline{h} hRR	p \overline{p} h \overline{h} RR	ppH \overline{h} rr	ppH \overline{h} RR
Pp \overline{h} hRr	p \overline{p} h \overline{h} Rr	ppHHrr	ppH \overline{h} Rr
Pp \overline{h} lrr	p \overline{p} h \overline{h} rr	.	ppHHRR
PpH \overline{h} RR	.	.	ppHHRr
PhH \overline{h} Rr	.	.	.
PpH \overline{h} rr	.	.	.
PpHHRR	.	.	.
PpHHRr	.	.	.
PpHHrr	.	.	.
ZZh \overline{h} RR	Z(WA)h \overline{h} RR	Z(WA)H \overline{h} rr	Z(WA)H \overline{h} RR
ZZh \overline{h} Rr	Z(WA)h \overline{h} Rr	Z(WA)HHrr	Z(WA)H \overline{h} Rr
ZZh \overline{h} rr	Z(WA)h \overline{h} rr	.	Z(WA)HHRR
ZZH \overline{h} RR	.	.	Z(WA)HHRr
ZZH \overline{h} Rr	.	.	.
ZZH \overline{h} rr	.	.	.
ZZHHRR	.	.	.
ZZHHRr	.	.	.
ZZHHrr	.	.	.

All the difficulties in connection with the inhibiting gene are got rid of if an activating gene in the W-chromosome is substituted, and it is assumed that this activating gene can produce the *polytes* pattern if the dominant gene for it is present in either the heterozygous or homozygous state, and that it can produce the *romulus* pattern, if the dominant gene for it is present in either the heterozygous or homozygous state, in addition to that for the *polytes* pattern. Fryer's version is given in the upper table, and this new one in the lower table, above. (WA) is the symbol used for the W-chromosome carrying the activating gene A, which on this hypothesis is present in every female. Fryer's suggestion that H and R are not independent genes, H alone producing the *polytes* pattern and R alone producing the *romulus* pattern, but that R is merely a modifier of H, is very probable. It is much more likely that a single activating gene can stimulate the production of two patterns, one determined by H alone and the other by H + R, than that it

can stimulate the production of two patterns, each determined by an independent gene, one by *H* and the other by *R*.

Jacobson's experiments with *Papilio memnon*, L. in Java show that the inheritance of its sex-limited female forms is closely parallel to that of the female forms of *polytes*. Baur gives an explanation that by altering his symbols can be made the same as Fryer's for *polytes*. Jacobson used the male-like form *laomedon*, Cram., which differs from the male chiefly in having a red spot at the base of the fore wing, *agenor*, Cram. with a red spot at the base, and white interneural stripes, and *achates*, Cram., a tailed form with a yellow basal spot, resembling *Pharmacophagus coon*. *Laomedon* and *agenor* are both tailless. It is probable that the form he calls *agenor* is really *isarcha*, because true *agenor* does not occur in Java. The genetic constitution of these three forms can be obtained by substituting *laomedon* for *cyrus* in the table, *agenor* for *polytes*, and *achates* for *romulus*. The constitution of the males of *memnon* would be the same as those of *polytes*. *Memnon*, however, has other sex-limited female forms in other parts of its range, and, if their inheritance is of the same kind and inter-breeding is possible, a much more complicated genetic series could be created.

Papilio dardanus has an even larger number of sex-limited female forms, but those that have been bred appear to stand in Mendelian relationship with one another, and it will probably be found that Fryer's explanation can be applied as well to them as to the forms of *polytes* and *memnon*, though instead of one there must be two or more important modifying genes. Other species like *Hypolimnias bolina* may be found to obey the same law, when the necessary data are available. The variation in the white females of *croceus* and other species of *Colias* is probably due to the action of subsidiary modifying genes, but, as far as I know, no experimental work has been undertaken to prove it.

Sex-limiting colouring in the male sex is very rare, but *Parasemia plantaginis*, L., ab. *hospita*, W.V., is a good example. Unfortunately the species is difficult to breed for more than one generation, and the inheritance of the white *hospita* coloration is unknown. Eggs laid by a wild female captured at Rannoch, the male parent being unknown, gave 30 typical females with yellow hind wings and 30 males, if those which failed to break their pupal skins are counted; of these 23 were typical and 7 were *hospita*. Mr. Frank Littlewood tells me that in Westmorland only about 2% of the wild males are *hospita*, but that from two pairings with *hospita* as the male parent he got *hospita* males among the offspring. In both cases many larvae died, and the broods were small. No exact record was kept, but only about 20% were *hospita*, and the rest of the males were typical. *Hospita* is probably dominant, but

the ratio in these three small broods is much nearer 1 : 3 than 1 : 1. If with further breeding experiments *hospita* proves to be a simple dominant sex-limited to the male, the inheritance could be explained by supposing that there is a dominant autosomal gene for the *hospita* coloration, and an inhibiting gene in the W-chromosome which prevents the white colour appearing in the females, even when the dominant gene in the autosome is present.

REFERENCES.

- EDWARDS.—*Butterflies of North America*, II.
 FISCHER.—*Ent. Zeitschr.*, Frankfurt, 1923-4, xxvii, pp. 1, 6, 11 and 14; 1929—30, xliii, pp. 151, 159, 184, and 194.
 FRASER and GORDON.—*Science*, 1928, lxvii, p. 470.
 FRYER.—*Phil. Trans. Roy. Soc.*, 1913, cciv, p. 7 (227).
 GEROTLD.—*Amer. Nat.*, 1911, xlv, p. 257; *Genetics*, 1923, viii, p. 495.
 GOLDSCHMIDT and FISCHER.—*Genetica*, 1922, iv, p. 247.
 JACOBSON.—*Tijdschr. v. Ent.*, 1909, lmi, p. 235.
 MORGAN, BRIDGES and STURTEVANT.—*The Genetics of Drosophila*, *Bibliographia Genetica*, 1925, ii, p. 109.

AGRAYLEA PALLIDULA, McL. (TRICHOPTERA), IN HAMPSHIRE.—This species was first added to the British list in August, 1913, when, in company with the Rev. A. E. Eaton, I took a single male on the banks of the Lamborne, in Berkshire. After an interval of thirteen years another record was made at Wicken Fen, where, in September, 1926, I obtained at light another single male. Finally, on July 17th of this year, at a small lake at Mottisfont, Hants, when gathering mare's tail weed (*Hippuris vulgaris*) for planting in some Trichoptera breeding-tanks at the Natural History Museum, I noticed at the roots of the leaves numerous *Agraylea* cases which I supposed belonged to the usual lake species *multipunctata*, Curt. But the next day adults began to emerge, and it was with some surprise and much pleasure that I recognized the far more unusual species *pallidula*, McL. Up to the moment of writing eight examples have been obtained from this bunch of weed.—MARTIN E. MOSELY; British Museum (Natural History), Cromwell Road, S.W. 7.

OXYETHIRA FELINA, Ris. (TRICHOPTERA, HYDROPTILIDAE), NEW TO BRITAIN.—It is perhaps a curious coincidence that, from the same piece of mare's tail from which, as recorded above, a good series of *Agraylea pallidula*, McL., was secured, there should also have emerged an *Oxyethira* new to the British fauna. *Oxyethira felina*, Ris, was described from a single male taken at the Katzenssee, near Zurich. I have no recollection of having seen any further record of the species. It is of interest, therefore, to note that it occurs at Mottisfont, Hants.—MARTIN E. MOSELY; British Museum (Natural History), Cromwell Road, S.W. 7, July 21st, 1932.

THREE MONTHS' BUTTERFLY COLLECTING IN GREECE.

BY BRIG.-GEN. C. H. C. VAN STRAUBENZEE, C.B., C.B.E.

(Concluded from p 159.)

Leucochloë daphidice Linn.—Common at K. and on lower slopes of M.

Euchloë crameri Butl. [= *belia* Auct.].—D. and K., summer form at K. from May 22nd onwards.

Anthocharis cardamines Linn.—K. and M., not common.

A. gruneri H.-S.—D., common; K., rare.

A. damone Boisd.—D., not very common.

Gonepteryx farinosa Zell.—D.

G. rhamni Linn.—K. and M.

G. cleopatra Linn.—One at D.

Colias croceus Fourc. and ♀ form *helice* Hb.—Common everywhere.

C. aurorina heldreichi Stgr.—M., ab.; only 3 form *fountainweae* Verity taken.

Leptidea sinapis Linn.—D. and K., not common.

Melanargia larissa Boisd.—K. and M., common, June.

Satyrus hermione Linn.—Observed below K. at end of June.

S. briseis Linn.—1 ♂ on the lower slopes of M. on June 30th.

S. anthelea amalthæa Friv.—Common at M. from mid June.

Pararge aegeria Linn.—K., not common.

P. roxelana Cram.—K., in some willows below the railway-line midway between the two bridges, June 25th.

P. megera Linn.—D. and K., common.

P. maera Linn.—D., common, and K.

Maniola jurtina Linn.—K., very common.

M. lycaon Rott.—Two only on the lower slopes of M., July 3rd.

Coenonympha paniphilus Linn.—D. and K., common.

Limnitis rivularis Scop.—Lower slopes of M., common in June.

Pyrameis atalanta Linn.—D. and K.

P. cardui Linn.—K., common.

Aglaïs urticae Linn.—K., rare.

Vanessa polychloros Linn.—K. and M., common.

V. antiopa Linn.—One observed on the lower slopes of M.

Polygonia c-album Linn.—K., rare.

P. egea Cram.—D. and K., not common.

Melitæa cinxia Linn.—M., June.

M. phoebe Schiff.—D., common; K., common.

M. trivia Schiff.—D., common from end of June.

Argynnis euphrosyne Linn.—M., June 11th, just before reaching Cherokobus.

- A. lathonia* Linn.—Everywhere.
A. niobe Linn., form *eris* Meig.—M., June, common.
A. paphia Linn.—K. and M., June, common.
A. pandora Schiff.—M., June.
Libythea celtis Fuessly.—M., one on June 10th.
Strymon spini Schiff.—M., June.
S. ilicis Esp.—K., June, common.
S. acaciae Fab.—K., June.
Heodes thersamon Esp.—Below K., 3 on May 19th, and 2 (presumably second brood) on July 5th.
H. phlaeas Linn.—D. and K.
H. dorilis Hufn.—K.
Syntarucus telicanns Lang.—One ♀ on the lower slope of M. on June 9th.
Cupido sebrus Hb.—One ♂ and 2 ♀♀ above K.
Plebeius argus Linn.—M., June, common.
P. sephirus Friv.—M., common, and K., June.
Lycaena agestis Schiff.—Everywhere common.
L. anteros Frr.—Eleven ♂♂ and 3 ♀♀ on Cherokobus June 14th to 24th.
L. icarus Rott.—Everywhere common.
L. amandus Schn.—K. and M., not common.
L. semiargus Rott.—Three above D. on Parnassus plateau.
L. helena Stgr.—K. and M., common, end of May and early June.
L. cyllarus Rott.—D. and K.
L. vicrama schiffermulleri Hem.—One at D. on April 29th, and one at M. on June 11th.
L. bavius Ev.—Two at K. on May 23rd and 27th.
Lycaenopsis argiolus Linn.—D. and K.
Carcharodus alceae australis Zell.—D. common.
C. orientalis Rev.—D.
Hesperia carthami Hb.—M., 2 on Cherokobus.
H. serratulae Ramb.—M.
H. orbifer Hb.—Everywhere common.
H. phlomidis H.-S.—M., locally common from June 28th.
Thanaos tages Linn.—K.
Thymelicus flava Brun.—One at K.

Altogether 83 species were taken during the three months; 35 at Delphi and 73 at Kalavryta and Mount Khelmos.

It may be useful to those proposing to collect in Greece if I add that before leaving England I studied the following publications:

Staudinger, O., 1871-72, Beiträge zur Lepidopterenfauna Griechenlands (*Hor. Soc. ent. Ross.*, 7 and 8).

- Rebel, H., 1903-05, *Lepidoptera aus Morea (Berlin ent. Zeit., 48, pp. 83-110)*; *Nachtrag (l.c., 48, pp. 243-249)*; *Nachtrag II (l.c., 50, pp. 291-314)*. *Beiträge zur Lepidopterenfauna Griechenlands (Verh. zool.-bot. Ges. Wien, 65, pp. 50-59)*.
 Fountaine, M. E., 1902, *Ent. Record, 14*, pp. 29-35 and 64-67.

SUPPLEMENTARY NOTES ON THE COLLECTION OF
 BUTTERFLIES MADE IN GREECE BY GENERAL
 VAN STRAUBENZEE IN 1931.

BY CAPT. A. F. HEMMING C.B.E.

Through General van Strauben-zee's kindness, I have had an opportunity of studying the collection of butterflies which he made in Greece in the spring and summer of 1931. The following notes, written at his invitation, deal with a few of the species of special interest which he took, and are intended to supplement the account that he has published of his captures.

SATYRIDAE.

Nytha fagi (Scop. 1763) [= *hermione* (Linn. 1764)].

General van Strauben-zee saw, but was unable to catch, what he took to be this species, in a locality below Kalavryta at the end of June. It is unfortunate that no specimens were obtained, as it must remain uncertain whether the species observed was, in fact, *fagi*, or was the closely allied species *syriaca* Staudinger (1871). Both species occur in Greece, there being in the British Museum specimens of *fagi* from Attica, and of *syriaca* from Saracli, in Northern Greece in the Hemming Coll. It is to be hoped that future collectors in Greece will make a special effort to obtain specimens from as many localities as possible, in order to elucidate the problem of the area of distribution of these species in this region.

Eumenis briseis (Linn. 1764).

The emergence of this species had hardly begun when General van Strauben-zee left Kalavryta, with the result that he only took a single ♂ on Mt. Khelmos on June 30th. Future collectors in this locality should make a special search for this species, as the specimen taken differs markedly from any other example of this species that I have seen from any locality, and if these differences proved constant, the Khelmos specimens would represent a very clearly defined subspecies.

In the specimen taken, the most conspicuous feature on the upperside is the almost complete obliteration by brown suffusion

of the white band that runs across the centre of the hind-wings. On the fore wings the white transverse band is irregular in form, the white patches in interspaces 1A and 1B being very small, and that in interspace 6 being exceptionally well developed. On the underside the hind wing presents a most unusual feature, the dark brown submedial band being complete, instead, as is always the case in this species, of being interrupted in the centre. This is due to this part of the discal cell being of the same dark colour as the rest of the band, instead of being of the same pale brown as the basal area. The post-discal band on the hind wing is also wider and more clearly defined. The length of the fore wing of this specimen is 26 mm.

LYCAENIDAE.

Scolitantides bavius (Ev. 1832).

The discovery of *bavius* in Greece is of great interest, as previously this species was known in western Europe only from Transsylvania. The specimens taken there by the late N. C. Rothschild were separated as a distinct subspecies by Diószeghy (1913), under the name *hungarica*. Through the kindness of the Hon. Mrs. N. C. Rothschild I have had an opportunity of studying the type series of *hungarica*, which I find is an insect quite unlike any European or Asiatic subspecies of *bavius*, being in the ♂ a bright silvery blue (on the upperside), in this respect, as also in the lighter and clearer markings on the underside (in both sexes), resembling much more nearly the North African *fatma* Oberthur (1890).

The specimens of *bavius* taken by General Casimir van Strauben-zee in Greece are far removed from *hungarica*, and belong to an undescribed subspecies which I now have pleasure in naming after him.

Scolitantides bavius casimiri, ssp. nov.

Not closely allied to any known subspecies of *bavius*, being, however, fairly near, in some respects, to the subspecies found at Constantinople, from which it differs as follows :

♂ *Upperside*.—Ground-colour on fore wings and hind wings dark blackish brown, thinly but evenly powdered with purplish-blue scales in the interneural spaces to within 2 mm. of the termen ; black discoidal spot of fore wings conspicuous ; on the hind wings there is a very striking series of dark orange submarginal spots in interspaces 1c, 2, 3 and 4, those in interspaces 2 and 3 being large and very conspicuous.

Underside.—Ground-colour dark ash-grey, of a darker tint than found in any other known subspecies. *Fore wings*: the black post-discal spots are very large (larger than in the other subspecies) ;

the discal, discoidal and basal spots as in specimens from Constantinople. *Hind wings*: blue scaling at base of wings relatively well marked (usually inconspicuous in *bavius* subspecies); black submarginal spots larger; band of orange spots differ from those in other subspecies by their darker colour, their larger size, and more rectangular shape; the chevrons by which these are surmounted are thin, almost straight black lines, instead of, as in *b. bavius*, being of a markedly arrow-head shape.

Average length of fore wing, 14 mm.

HABITAT.—Greece, Kalavryta. ♂ holotype, "Kalavryta, 27.v.1931, *C. van Straubenzee*," in the British Museum (B.M. Type No. Rh. 395), and ♂ paratype, "Kalavryta, 23.v.1931," in General van Straubenzee's collection.

Philotes vicrama schiffermulleri (Hemming, 1929).

When in 1929 I separated this species from *baton* Bergst., and described its European subspecies under this name, the only Greek material at my disposal were specimens from Greek Macedonia (Salonica) and from Mt. Parnassus. General van Straubenzee's capture of this species on Mt. Khelmos is, therefore, of interest as evidence that it occurs in the Morea.

I take this opportunity of correcting a mistake in nomenclature which I overlooked in my revision of this group. The Middle-East subspecies of *P. vicrama* Moore was named *Lycaena baton* var. *clara* by Staudinger in 1901 (*Cat. Lep.*, ed. 3: 81). This name is, however, invalid, as it is a primary homonym of a subspecies of *Lycaena heteronea* Boisdu. named *Lycaena clara* by Henry Edwards in 1877 (*Pacific Coast Lep.*, No. 26: 1). I accordingly propose the name *Philotes vicrama astabene* **nom. nov.** pro. *Lycaena baton* var. *clara* Stgr. (1901).

HESPERIDAE.

Syrichtus phlomidis (H.-S. 1845).

Until General van Straubenzee's long series of this species from Mt. Khelmos became available for study, the only European specimens which I had seen were a pair from Parnassus, in the British Museum. Herrich-Schäffer's types were taken on the shores of the Sea of Marmora, and the figures which he gives agree exactly with General van Straubenzee's specimens. A comparison of these with specimens from other localities in the British Museum discloses the fact that *phlomidis* has two well-defined subspecies, viz.:

(a) Ssp. *phlomidis* H.-S., occurring in Greece, on the coast of the Sea of Marmora, and in western Asia (e.g. at Brussa). It is, no doubt, this subspecies that Haig-Thomas (1931, *Ent. Rec.*,

43: 62) and Rebel and Zerny (1931, *Denkschr. Akad. Wiss. Wien.* 103: 84) have recorded from various localities in Albania.

(b) An undescribed subspecies from eastern Asia Minor, Armenia and Persia.

This undescribed subspecies I name—

***Syrichtus phlomidis eupator* ssp. nov.**

Powellia phlomidis H.-S., Warren nec H.-S. 1926 *Trans. Ent. Soc. Lond.* 74: 146, pl. 54, figs. 1-5 ♂, 6-8 ♀.

Differs from *nomino*-typical *phlomidis* as follows:

♂♂. *Upperside*.—Ground-colour less black (*i. e.* greyer); suffusion of whitish scales over the ground-colour on fore wing conspicuous (absent in *ph. phlomidis* except at base of fore wings, where, however, it is prominent owing to the blacker tone of the ground-colour). *Fore wings*: white spotting arranged generally as in *ph. phlomidis* but conspicuously larger; discal spot almost the same size (instead of being about half the size of) as the discoidal lunule; in the median row, spots 7, 8 and 9 form a prominent white patch (in *ph. phlomidis* these spots form a narrow white line); spot 6 in this series present (absent in *ph. phlomidis*): the outer row of spots complete and larger than in *ph. phlomidis*. *Hind wings*: spots arranged as in *ph. phlomidis* but larger.

Underside.—*Fore wings*: Ground-colour greyer (not so black as in *ph. phlomidis*) and apical patch a paler shade of greenish yellow; conspicuous whitish suffusion along the termen, with the result that the last four white spots (Nos. 5 to 8) in the outer row are blurred and indistinct (in *ph. phlomidis* there is practically no white suffusion, and these spots, therefore, stand out distinctly from the ground-colour). *Hind wings*: Ground-colour a paler shade of greenish-yellow; white spots (especially those in the marginal row) stand out, therefore, less clearly against the ground-colour. Nervures hardly outlined at all with yellow scales (these are more marked in *ph. phlomidis*).

Average length of fore wing.—♂ 14 mm., ♀ 15 mm. (♂ 13 mm., ♀ 14 mm. in *ph. phlomidis*).

HABITAT.—*Eastern Asia Minor*, Amasia; *Armenia*, Ordoubad and Kasikoparan and "*Hyrcania*," *i. e.* N.-E. Persia. This record probably refers to Schahrud, where Bienert (1870) records *phlomidis* as occurring on the steppes and on the low hills.

♂ holotype, "Amasia, Turkey-in-Asia, Frey Coll. 1890" (B.M. Type No. Rh. 391).

♀ allotype, "Amasia, Elwes Coll." (B.M. Type No. Rh. 392).

Paratypes, ♂2 from Amasia in the British Museum (B.M. Type No. Rh. 393 and 394) and ♂1 also from Amasia in the Hemming Coll. (A. F. Hemming Coll. No. 12790).

The localities given above are all taken from labels on specimens of *eupator* in the British Museum. It has, however, no doubt a much wider range in the Middle East.

It appears to be single-brooded. Bienert (1870) records it as being on the wing (in Persia) at the end of May. Staudinger (1877) found that at Amasia the emergence began on June 11th and continued till the end of July. General van Straubenzee's specimens of nomino-typical *phlomidis* from Mt. Khelmos were taken from June 28th to July 1st (♂♂ plentiful, ♀♀ hardly out). Haig-Thomas (1931) found the species "just out" on June 22nd on the hills between lakes Malik and Ochrida in Albania. In the same country, Zerny (Rebel and Zerny, 1931) found it between June 26th and July 3rd.

The name *eupator* selected for this subspecies was one of the names of Mithridates the Great, King of Pontus, who was born at Amasia, the locality in which the type-specimens were taken.

HYDRILLA PALUSTRIS IN SUFFOLK.—On the night of June 18th Mr. Arnold Hughes and myself, when working with petrol vapour lamps, attracted two male *Hydrilla palustris* Hb. The first one appeared on the sheet at 11.30 p.m., and the second flew up to the headlights of the car at 1.45 a.m. Both were in good condition in spite of the lateness of the date. The locality was a typical Breckland field near Mildenhall in Suffolk, with sandy soil and a mixed vegetation of coarse grass, sorrel and campion, etc., and agrees very closely with the type of locality where Herr H. Raebel found this insect in Germany, as described by Mr. Edelsten in the July *Entomologist*. On June 24th I was at the same place and searched the grasses with a lamp, but it was a very windy night and I was unable to detect anything.—R. P. DEMUTH; 7, Holland Park Avenue, W. 11.

THE LARVA OF PARASCOTIA FULIGINARIA, L., FEEDING ON POLYSTICTUS ABIETINUS.—On June 11th Mr. C. N. Hawkins and I found a full-grown larva of *Parascotia fuliginaria* on the under-surface of a fallen pine tree, resting outstretched on the centre of a patch of fungus, part of which it had eaten. The wood in which it was found consists of pines only, and is situated on a heather-clad hill some miles from Camberley, and there were many other fallen trees, most of which had a profuse growth of the same fungus growing on them. In spite of a very careful search we were unable to find a second larva. Mr. J. Ramsbottom has kindly identified the fungus as *Polystictus abietinus* (Dicks.), Fr. It is a bracket fungus, white above and dark pink or purplish below, minutely pitted on its underside. It grows in parallel lines on the sides of the fallen trunks, forming brackets, and in circular or ovoid patches with free edges on the undersides of the trunks. It appeared to be the only fungus in this wood. It is interesting to have discovered another natural food-plant of this larva, in addition to *Polystictus versicolor*, the one recorded by Mr. E. E. Green in his interesting paper in the March number of this magazine.—E. A. COCKAYNE; 116, Westbourne Terrace, W. 2.

LEPIDOPTERA AT ROSTREVOR IN 1930.

BY REV. W. F. JOHNSON, M.A., F.E.S.

THE year 1930 was not particularly good for Lepidoptera, for there was more than the average amount of rain and a corresponding lack of sunshine.

Two specimens of *Sphinx convolvuli* were brought to me, one of which was caught by a boy on whose cap it had alighted—a curious sort of a flower! I was very pleased to get *Thyatira batis*, for I had only once met with it, many years ago at Poyntzpass, where I got a single specimen at sugar, but though I sugared repeatedly in the same place I never saw another. *Graptolitha ornithopus* was sitting on a wall, its colour assimilating to the grey granite of which the wall was built. This is the second specimen I have met with here.

I made an expedition to Batt's Wood on the afternoon of June 5th, but met with poor success. Mr. Atkinson caught two beautiful *Anarta myrtilli*, and there were a number of *Prothymnia viridaria* among rough grass; of these we got a good many, some of which were entirely dark, ? ab. *fusca* Tutt. Mr. Atkinson also took a fine series of *Geometra papilionaria* at the vicarage, and I was delighted to get such a fine set, for I had not met with it at Armagh or Poyntzpass. The only time I had met with it before I came here was at Maghery, Lough Neagh, in 1885, when I beat a single specimen out of an alder bush in Derrywarragh Island. I was unfortunately misled by the message I got about *Pachys betularia*, so that instead of going myself I merely sent a killing-bottle, otherwise I might have been able to secure ova and rear some varieties. *Tortrix podana* and *T. ministrana* were a complete puzzle to me, for I could not find anything to correspond with them in Stainton's *Manual*, so I sent them to my good friend Mr. A. W. Stelfox, M.R.I.A., of the Dublin Museum, who kindly compared them with the Museum collection and named them for me, and then, of course, I found out that they were not mentioned in the *Manual*.

I have to thank Mr. R. G. Atkinson for most kind and efficient help in collecting. But for his aid I should have a very poor list indeed. All marked "vicarage," "woods," and "viii" were captured by him. I have omitted the more ordinary species mentioned in previous lists.

RHOPALOCERA.

Pyrameis atalanta, in garden, 29.iv.

Vanessa io, on wing at vicarage, 4.v.

HETEROCERA.

Sphinx convolvuli, 28.viii, 18.x. per Mr. Atkinson; *Macroglossa stellatarum*, 5.ix, in garden at phlox; *Thyatira batis*, 30.vii, vicarage, at light; I was also sent a specimen taken by my sister-in-law, Mrs. R. D. Cox, at Lisnawilly, Dundalk, 10.vii; *Poecilocampa populi*, 2.xii, vicarage, 7.xii, gate-pillar on roadside; *Macrothylacia rubi*, ♀, 3.vii, sent from Enniskillen; Mr. Atkinson saw larvae in the neighbourhood of Batt's Wood, but did not meet with the moth; *Cilix glaucata*, viii; *Parasemia plantaginis*, 14.vi, Batt's Wood; *Acronycta psi*, 3.vii, vicarage; *Noctua augur*, 3.vii, vicarage; *N. triangulum*, 4, 8, 12.vii, vicarage, 17.vii, house; *N. umbrosa*, viii; *Mamestra glauca*, 5.vi, vicarage; *Hecatera serena*, 8.vi, woods; *Cerigo matura*, 12.vii, vicarage; *Apamea ophiogramma*, 9.vii, a light-coloured form taken by Mr. Atkinson on the roadside in the evening; *Aporophyla nigra*, 3.ix, in house taken by Mrs. Johnson; *Leucania lithargyria*, 3.vii; *Taeniocampa incerta*, 17, 19, 20.iv; *Amathes macilenta*, 27.x, all three at vicarage; *Graptolitha ornithopus*, 11.x, on a wall; *Lobophora sexalisata*, 16.vii, in house; *Cheimatobia brumata*, ♀, 7.xii, on a gate-pillar; *Triphosa dubitata*, viii; *Cidaria corylata*, 18.vi, woods; *Thera variata*, *Amoebe viridaria*, *Hydriomena impluviata*, 5.vii, Batt's Wood; *Perizoma alchemillata*, 12.vii, vicarage, at light; *Eupithecia vulgata*, 6.v, vicarage; *E. subfulvata*, viii; *E. punnilata*, 29.iv, in house; *E. rectangulata*, 11.vi, in house; *Numeria pulveraria*, 5.vi, vicarage; *Eurymene dolabraria*, 3.vi, vicarage, taken by Miss Atkinson at light—the ground-colour is a beautiful golden and the dark spots are purple; *Hybernia aurantiaria*, ♂, 18.xii, vicarage; *H. defoliaria*, ♂, 14.i, caught by Mr. Atkinson at electric street light, 29.x, vicarage, 19.xii, in house by Mrs. Johnson—the cross bands are well marked in this specimen; *Pachys betularia* type and var. *doubledayaria*, 2.v, on window-sill; *Boarmia gemmaria* ab. *rhomboidaria*, 10.vii, Lisnawilly, Dundalk, per Mrs. Cox, 24.vii, vicarage, at light; *Tephrosia crepuscularia*, 24.v, vicarage; *T. punctularia*, *Bupalus piniaria*, ♂♀, 5.vi, Batt's Wood—this is the first time I have met with the female of this species; *Ematurga atomaria*, ♂♀, 3.vi, Yellow Water Valley; *Pyrausta ostrinalis*, 5.vi, vicarage; *P. purpuralis*, viii; *Botys ruralis* (*verticalis*), *Pionea stramentalis*, viii; *Tortrix podana*, 8.vii, vicarage, 17.vii, garden; *T. ministrana*, 7.vi.1929, in woods; *T. viridana*, 1.vii, woods; *Pardia tripunctana*, 10.vii, garden; *Orthotaenia antiquana*, 17.vii, house at light; *Xanthosetia zoegana*, 20.vi, house, 4.12.vii, Vicarage; *Depressaria umbellana*, 27.iv, in house—probably it had hibernated, as it was in a worn condition.

Rostrevor;

September 18th, 1931.

NOTES AND OBSERVATIONS.

MAY EMERGENCES.—Referring to Mr. E. P. Whitcombe's note on sugaring during May, in a wood in the Canterbury District on nine consecutive nights from May 27th to June 4th sugar failed to produce a single moth, and there was a complete absence of Noctuids both at dusk and at the acetylene flare. The days were warm and sunny, but at night it became chilly and there was generally a heavy dew.—GEORGE H. YODEN; 84, Maison Dieu Road, Dover.

COLIAS CROCEUS IN HANTS.—On May 22nd I saw a single *C. croceus* at Milford-on-Sea, Hants.—JOHN B. HICKS; 30 Stanhope Gardens, S.W. 7.

GYNANDROUS MELANARGIA GALATHEA.—I should like to record the capture yesterday in the Cotswolds of a gynandrous *M. galathea*. The right side is male, the left female. I don't know whether similar specimens have been recorded before in British *galathea*, and should be interested if any reader can inform me.—J. N. MARCON; Winton Croft, Binfield, Bracknell, Berks July 17th, 1932.

ACHERONTIA ATROPOS, LINN., IN GLOUCESTER.—On June 6th a fine specimen of the Death's Head was brought to me by a National school-boy, Eric John Beard (13), who told me that he had just taken it on the wall of a house in Alfred Street in this city. It expands $4\frac{1}{2}$ inches and is in good condition, except for two slight chips in the hind margin of the primaries. As I transferred it into my killing bottle it uttered its curious squeaking sound. I presume that it was an immigrant, and had flown over from the Continent aided by the prevailing north-east wind. Mr. F. H. Tearle, of this city, informs me that *A. atropos* was quite a common insect at Gainshorough in 1857. He says, *in litt.*: "I watched them from the larvae to perfect insect. I don't agree with most entomologists that *atropos* was not indigenous—it became scarce through closer cultivation of the potato."—C. GRANVILLE CLUTTERBUCK, F.E.S.; 23, Heathville Road, Gloucester, June 18th, 1932.

IMMIGRATION RECORDS.—With reference to the notes on this subject in the July issue (p. 164), one *Vanessa atalanta* and several specimens of *V. cardui* and *Plusia gamma* were taken by Mr. W. E. Busbridge and myself in the Canterbury district on May 29th, 1932.—G. H. YODEN; 84, Maison Dieu Road, Dover.

[In this connection, Mr. A. H. Sperring calls attention to an error in the records referred to above. The *V. atalanta* he reported was seen at Bignor, not Bognor, Park.—ED.]

LATE EMERGENCE AND SCARCITY OF SPRING RHOPALOCERA.—Butterflies have been generally late and exceptionally scarce round here owing to the abnormally wet and cold May. One patch of ground was under almost daily observation from the middle of that month, and five species usually common on it and easily noted at rest in the evening were first seen as follows: *Hesperia malvae*, May 23rd; *Thanaos tages*, June 2nd; *Coenonympha pamphilus*,

June 2nd; *Lycaena astrarche*, June 10th; *Polyommatus icarus*, June 12th. Nothing has been seen of *Cyaniris argiolus* or *Heodes phlaeas*. *Callophrys rubi* was noted the first week in June. At time of writing (June 20th) specimens of *Polyommatus icarus* can be counted on fingers of both hands on a ground where they are usually present in hundreds. On the other side of the account, *Cupido minima* is more plentiful than last year, and appeared punctually about June 10th. I believe N.W. Herts is usually about a week later than the North Downs, and a comparison of first dates with that area this spring would be interesting.—S. B. HODGSON; St. Philips. Charles Street, Berkhamsted, Herts.

A PECULIAR MOTH.—“Can any reader give me information regarding an uncommon species of moth? It measures $4\frac{1}{2}$ inches across, and has four separate tails.—W. PERRY; 46, Lisson Grove, Plymouth.”

The above letter in the *Western Morning News* of May 2nd last caught my eye and aroused my curiosity. On asking the writer for further details with a view to identification of the specimen (which I imagined might be a *Charaxes*) the following facts were elicited, and Mr. Perry sent me a photo of the moth in question. as he was afraid to adopt my suggestion to send me the specimen for inspection (although I told him how to pack it) in case it suffered damage in transit.

About the end of May, 1931, Mr. Perry was visiting Cremyll, a little week-end holiday resort near the Mount Edgcumbe estate, on the shore of the Tamar estuary on the Cornwall side, and he found a cocoon spun up not many feet from the ground under a leaf on a tree, since determined as *Ulmus campestris*. He took the cocoon home and kept it out of curiosity for about three weeks, during which time, especially about ten days before it emerged, he could hear the pupa moving inside, which he thought was the fluttering of the moth, as he says in one of his letters to me, “If holding cocoon close to the ear one could plainly hear it fluttering inside.” Emergence took place, therefore, about the middle of June, and about three or four hours later he killed the moth with formalin and pinned it in a case with other foreign moths and butterflies. He says he had seen these things (*i. e.* cocoons) before, but not nearly so large, and he looked round at the time he found it but could not find any more. He has visited the same place many times since but without result. Unfortunately he did not keep the cocoon, but he describes it as about an inch and three-quarters in length, light brown in colour and soft but very tough, except at the end where the moth emerged. The moth he describes as very dark brown with a pure white V-shaped mark across the wings, and the edges of the hind-wings and tips of the tails also pure white. The Editor has kindly determined the species as *Lyssidia zampa* (Butler)—a common moth in India and the Far East.

To suggest a reason for the occurrence of this striking moth in the neighbourhood is easy enough, in view of the fact that Plymouth

is a busy port to which goods of many kinds find their way from all parts of the world, and warships from foreign stations anchor in the Hamoaze. It may be that cocoons were introduced in some way and moths escaping bred on the spot where the cocoon was found. But a more likely explanation is that the larva was introduced with a foreign plant to the Mount Edgcumbe gardens. In either case, however, it is by no means easy to understand exactly how the larva reached the place where the cocoon was found, and one can only surmise that it either escaped from the Mount Edgcumbe grounds when full-fed and wandered off in the usual way, seeking a place to pupate; or that a visitor to Cremyll—possibly a sailor from one of the ships—had become possessed of it, and perhaps tiring of it, had released it. It must be confessed, however, that any such explanation as those offered can be only the merest conjecture; but if the food-plant of the larva were known a more plausible theory might be put forward, and it may be that some reader may be able to throw more light on this very remarkable occurrence. I am inviting information through the columns of the *Western Morning News*, and will report the result, if worth while, in due course. I may add that, as Plymouth is over 60 miles from Truro, a visit would occupy practically a whole day, and I have not been able to spare the time, quite apart from the expense!—C. NICHOLSON; "Nansgwithick," Tresillian, Probus, Cornwall, June 12th, 1932.

[The only reference I can trace that seems definitely to refer to the larva of this species is contained in the *Malayan Agricultural Journal*, vol. xv, p. 409. Cedric Dover there states that he has found it in the Malay Peninsula feeding on "Malay Apple" (*Eugenia malaccensis*).—ED.]

RECENT LITERATURE.

Catalogue of the Type-Specimens of Lepidoptera in the Hill Museum.
By A. G. GABRIEL, F.E.S.

At the Fourth International Congress of Entomology, held at Ithaca, N.Y., in 1928, a resolution was passed stressing the advisability of the publication of such catalogues as this by institutions possessed of large numbers of type-specimens. So far as we know this catalogue is the only response to date. The British Museum for some unfathomed reason promptly suspended publication of the lists of its *Rhopalocera* types, after setting such an excellent example, and so far has not taken the matter up again. It is admitted on all sides that such lists are of considerable value to specialists and to curators; they are very inexpensive to publish, yet nothing further has been achieved. What librarian would accept responsibility for a library that was not catalogued? Why, therefore, should the Museum curator be debarred from having a list of his most valuable treasures? What wasted hours of searching would be saved! What types would

be saved! That Mr. Gabriel, who was responsible for the whole of the British Museum lists, after the idea had germinated, was well qualified to catalogue the types in the Hill Museum is clearly shown in the admirable catalogue he has produced. We know how much work was involved in checking all these 3000 and more types, their localities and all the references, and how carefully it was done. The result is a lasting memorial to the Hill Museum and an epitome of its activities, upon which the author is to be congratulated; one's only regret is that Mr. Joicey did not himself live to see the completion of the work he put in hand.

Hunting Insects in the South Seas. By Miss EVELYN CHEESMAN.
Pp. xii + 244. 8vo. 8 plates. London: Philip Allan & Co., Ltd., 1932.

Miss Cheesman is an entomologist of great enthusiasm, and a writer with no little descriptive ability; at times her enthusiasm seems to outrun her pen, as, for example, when she describes a meal she took at a "little Chinese store, washed down with native coffee"—but as Miss Cheesman herself says, anything may happen in the South Sea islands. Apart from a few little misconstructions of this kind, which are only momentarily disconcerting, the book is most attractively written, and certainly an improvement on *Islands near the Sun*. That volume may, perhaps, be likened to an account of Miss Cheesman's apprenticeship to the South Seas; the later one shows her thoroughly adapted to the environment, and able to pursue her entomological researches with complete indifference to her surroundings. Not infrequently she ran grave risk of harm, not so much from natives or even "debbil-debbils," as from her own intrepid desire to get to out-of-the-way places; how near her exploration of "le desert" on Nuku-Hiva came to bringing her entomological activities to an untimely end is very vividly described in her final chapter.

The whole book is crammed with observations of all sorts and kinds upon insects of every order: Potter-wasps building on a clothes line and fighting for clay when the puddles dried up; kingfishers feeding on the distasteful butterfly *Danaida plexippus* (the Monarch or Milkweed); swarms of aquatic grasshoppers; ants which rescued their kith and kin from drowning when workers were scarce, but let them drown when the nests were over-populated, etc. There are interesting stories on almost every page. Yet sometimes it seems as if Miss Cheesman's imagination gets the better of her—the wish, a pretty one, is father to the thought: the crimson lilies which opened at the breath of the *Convolvulus* Hawk Moth, and the female *Hypolimnas bolina* which laid her eggs on the ground where the seedling food-plant was about to break the soil, are cases in point—but perhaps we exaggerate. There is one thing, however, for which alone the book is worth buying, and that is Miss Cheesman's description of the really ludicrous *Stephanid* wasp which she illustrates on p. 188.

A Text-Book of Practical Entomology. By FRANK BALFOUR-BROWNE. M.A.(Oxon. et Cantab.). F.R.S.E., F.Z.S., F.L.S., F.E.S. London: Edward Arnold & Co., 1932. Pp. 191. Price 18s.

Altruism is self-aggression overloaded with blandishments. Perhaps the process is not a very conscious one, and it is often characterized by great sincerity. The modern tendency to publish lecture-notes or directions for practical work in the laboratory in book-form, in order to make the acquisition of knowledge easy for young people, is a form of altruism which can hardly be included in the above definition. There is no doubt that the author is actuated by high motives, for he states in the preface that during the days of his own apprenticeship the student was given boxes full of insects and Dr. Sharp's volumes of the *Cambridge Natural History*, and was told to "go ahead." But he thinks that he would employ this method if it were necessary to dissuade people from the study of insects. Yet the fact remains that the author himself was not dissuaded and has "gone ahead." What is the reason? In the answer to this question lies a principle which the teacher should recognize. Nobody can teach anybody anything. The business of the teacher is to stimulate interest, to create an environment in such a way as to cause the organism (here the student) to reach out for things it wants to acquire. Apart from accidental determining circumstances, the attitude of mind with which to approach the study of any subject should be discussed at the beginning of a text-book. Once this is clearly grasped it does not matter whether the student is given boxes full of insects and Dr. Sharp's volumes, or the latest text-books of exquisite design.

The book under review is a compilation of the author's laboratory directions. It adopts the type system of teaching, and gives practical directions for dealing with a large number of forms. It is divided into three parts, the first being the elementary, the second the more advanced, and the third part contains what is described as the Principles of Systematic Entomology. If the reader expects here any discussion, formulation or enunciation of the principles of the science of "systematics," such as its aims, its scope, its methods, its limitations, its relationship with the other branches of the science, or the selection and value of a "systematic character," he will be disappointed. This part contains structural details of various groups of insects, notes on the wing venations, keys to the larvae of Coleoptera and Lepidoptera, the latter being adapted from the works of previous writers, which the author duly acknowledges.

The book is beautifully printed and sumptuously produced. It is well illustrated, the figures being large and boldly drawn, though lacking in artistic finish. The table of contents is skilfully drawn up. A more exhaustive index would have added to its value as a book of reference. One would have wished it to be completely free from errors, because some of them would puzzle the young reader. For example, on p. 141 the second alternative of the category under 19 bears the number 25 on the right-hand margin, which is obviously an error, because the same number occurs on the next page on the

right-hand margin. On p. 143 the sixth line contains (Hirysomelidae (Cassinae); probably "Cassinae" is a printer's error, for the name is derived from a Latin word, "Cassida," meaning helmet. On the whole the book should prove useful as an aid to the study of insect structure.

S. MAULIK.

SOCIETIES

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*April 14th, 1932.*—T. H. L. Grosvenor, F.E.S., President, in the Chair.—The decease of Mr. R. South, a past President, was reported.—Mr. Downes exhibited a short series of *Drepana falcatoria* bred from Wimbledon larvae in July, 1931, except one which went over until March, 1932; Messrs. Downes, Ennis and MacNulty, a series of *Errans marginaria* with ab. *fuscata* and intermediate forms from Wimbledon and ova of numerous spring Lepidoptera from the same locality: Mr. C. N. Hawkins, a captured and bred series of *Lobophora halterata* including ab. *zonata* from Surrey; Mr. Eagles, a ♂ *Polyommatus icarus* showing homoeosis in the shape of a blue spot on the underside of the right fore wing; Mr. A. de B. Goodman, the Lepidoptera which had come to light in his room at Shenley Wood, Bucks. with notes on the species. Mr. A. E. Tonge read a paper, The Ova of British Lepidoptera, III, dealing with the *Noctundae*, and showed many lantern-slides.

April 25th.—The President in the Chair.—Messrs. H. Ennis, of Wimbledon, and A. H. Stringer, of Croydon, were elected members.—Mr. Jacobs exhibited larval cases of *Coleophora caespitella* on heads of the rush, *Juncus communis*; Mr. Downes, ova of *Phigalia pedaria*, to show changes of colour at various periods after oviposition; Mr. Wainwright, the very bright green ova of *Lycia hirtaria*; Dr. Bull, larvae of *Noctua baia* from Ham Street, Kent; Mr. Ennis, larvae of *Omphalocelis lunosa* from Wimbledon. Mr. H. W. Andrews gave a series of Notes on the Characteristics and Occurrence of the Different Families and Larger Genera of British Diptera.

May 12th, 1932.—The President in the Chair.—Mr. S. N. A. Jacobs exhibited and read notes on the larvae of *Coleophora fuscedinella* and their method of case-construction. Mr. Ennis exhibited larvae of *Triphaena fimbria*; Mr. Blair, larvae of *Agdistis benneti* and of *A. statius*, and pointed out their differences; Mr. S. Wakeley, *Semioscopis avellanella* from West Wickham. Dr. Bull showed an asymmetrically marked *Hypocrita jacobaeae*, and communicated a list of dates of appearance of a number of spring Lepidoptera in W. Kent. Mr. Newman gave an interesting account of his collecting observations during the 1931 summer season.

May 26th, 1932.—The President in the Chair.—Mr. W. H. Windham, of Chiswick, and Mr. W. S. C. Williams, of Chingford, were elected members.—Mr. Jacobs exhibited a melanic *Biston strataria*;

Mr. Dennis *Pieris brassicae* with the apical dark grey blotches traversed by strong white nervures; Mr. H. Main, *Calosoma sycophanta*, a beetle which is now being used in the U.S.A. to deal with the devastating pest, *Lymantria dispar*. Mr. Main also showed a female *Drilus flarescens*, the larvae of which feed on snails, going from shell to shell. Lepidopterous larvae were exhibited by Messrs. A. A. W. Buckstone, Stanley Smith, S. Wakeley, Eagles, Downes, Bliss and Hawarth. Mr. K. G. Blair read a paper on Wegener's Theory of the Origin of Continents and Oceans.—HY. J. TURNER (*Hon. Editor of Proceedings*).

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at Eastbourne on May 28th, 1932. Mr. Robert Adkin in the Chair. Members present in addition to the Chairman: Mr. H. Donisthorpe, Prof. E. B. Poulton, Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, Dr. Harry Eltringham, Mr. W. J. Kaye. Visitors present: Mr. B. W. Adkin, Mr. H. W. Andrews, Dr. R. R. Armstrong, Maj. E. E. Austen, D.S.O., Mr. G. T. Bethune Baker, Mr. E. C. Bedwell, Mr. K. G. Blair, Dr. Malcolm Burr, Capt. J. D. Dannreuther, R.N., Mr. H. M. Edelsten, Mr. F. W. Frohawk, Col. F. A. Labouchere, Mr. H. Lankester, Mr. Hugh Main, Rev. John W. Metcalfe, Mr. W. Rait-Smith, Mr. Edwin P. Sharp, Mr. J. R. le B. Tomlin, Mr. Alfred E. Tonge, Mr. H. J. Turner, Mr. G. C. Leman, Rev. Geo. Wheeler, Mr. Cyril G. M. de Worms. Several of the guests arrived by car. Those travelling by train were met at the station by the Chairman and conveyed to the Grand Hotel, where luncheon was provided in a private room at 1.15 p.m. After luncheon the party divided, one section making a tour of the Downs and the other of the Crumbles. The latter locality provided Mr. Collin with a series of *Delia flavidipennis*, Stein., on *Silene*. The Entomological Club Supper took place at the Grand Hotel at 6 o'clock, and after a most enjoyable evening many of the guests returned to London. The chairman had kindly extended an invitation to all who were able to stay over the week-end and this was very freely accepted, a considerable number remaining. Owing to Mrs. Adkin's continued delicate health all were accommodated at the Grand Hotel. On Sunday morning an excursion was organized to Abbots Wood. The rides and wood generally after the recent rains were in a very sodden and muddy condition. The weather at first was rather dull and insects appeared to be scarce, but during the morning the sun shone brilliantly and insects were very plentiful, and *Pyrochroa coccinea* was flying freely in the sunshine. On returning to Eastbourne luncheon was provided at the Grand Hotel. During the afternoon a visit was paid to Hodeslea, Meads, the Chairman's residence, where tea was provided and the gardens inspected. In the evening the Chairman and his family entertained the guests to dinner at the Grand Hotel, after which an excellent concert by the Hotel Band was much enjoyed. The meeting was throughout most successful and enjoyable, and the party broke up on Monday morning.—H. WILLOUGHBY-ELLIS.

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[No. 832

GALL-CAUSING CYNIPIDAE IN BRITAIN.

BY M. NIBLETT AND H. J. BURKILL, M.A., F.R.G.S.

THE articles recently published in the *Entomologist* on British Cynipidae have included many species of gall-flies. Mr. Claude Morley has apparently studied in particular the insects rather than the galls they cause. The insects, however, are not so noticeable as their galls, so that any list compiled mainly from flies taken is hardly likely to be as complete as one based on the occurrence of the galls. Many species have been added to the British list in recent years which seem to have escaped the notice of Mr. Morley, and as a consequence his list lacks the completeness he no doubt desired.

The members of the Plant-Galls Section of the London Natural History Society have had under their observation many of these species of gall-causers, and the result of these observations as listed below may serve to supplement the "synopsis" referred to.

1. *Rhodites rosae* Linn. This has been recorded from a number of wild roses, including *Rosa mollis*, *rubiginosa*, *canina*, *arvensis*, *dumetorum*, *micrantha*, *tomentosa*, *coriifolia*, *suberecta* and *rubrifolia*.

Prof. J. W. H. Harrison has observed in his garden a decided preference of the insects for *R. canina* form *lutetiana* (*Vasculum*, January, 1922, pp. 33-37; also *Entom.*, November, 1916, p. 242).

Mr. G. B. Walsh (*Ent. Mo. Mag.*, July, 1924) gives some interesting figures on the proportion of sexes, showing a much higher percentage of males bred out than other observers had recorded.

2. *Rhodites nervosus* Curt. Though apparently not common, it can be found in many districts. We have records from Derbyshire, Durham, Middlesex, Northumberland, Surrey, Sussex and Yorkshire, while Prof. J. W. Carr (*Invertebrate Fauna of Nottinghamshire*) gives six localities for the galls on *Rosa canina*.

We know of it on *R. canina*, *arvensis*, *rubiginosa*, *stylosa* and *dumetorum*.

3. *Rhodites spinosissimae* Gir. On *Rosa spinosissima* type and var. *pimpinellifolia*. Abundant in one locality in Surrey. Also recorded from Durham, Northumberland, Sussex and Cornwall.

4. *Rhodites eglanteriae* Htg. Generally distributed. Recorded from *Rosa canina*, *arvensis*, *rubiginosa*, *spinosissima*, *mollis*, *stylosa*, *micrantha*, *tomentosa* and *dumetorum*. Also *R. canina* form *lutetiana*, and *glauca* (Prof. J. W. H. Harrison, *Entom.*, November, 1917) and

R. pimpinellifolia (*Vasculum*, July, 1918, October, 1926, April, 1927, and July, 1927).

5. *Rhodites mayri* Schl. Irregularly shaped somewhat spherical galls on buds and twigs, becoming woody as they mature. Covered with many fine spines or bristles. Green turning pink to crimson in colour. Uni- or multi-cellular. This species seems to have been first recorded for Britain by Prof. J. W. H. Harrison, who found it on *Rosa mollissima*, m. *cuspidatoides*, Crep. in Durham (*Entomologist*, November, 1916, p. 242). It has since been found by us in West Kent on *R. canina*, *rubiginosa* and *micrantha* (*Entom.*, January, 1929, p. 24, and *London Naturalist*, 1928, 1929, 1930 and 1931).

6. *Diastrophus rubi* Bouché. Recorded from various localities but only found abundantly in one area, i. e. on the Boulder Clay on the cliffs north of Scarborough some twenty-four years ago. Mr. C. Morley also noted this preference for clay in Suffolk (see *Entom.*, February, 1916, p. 32). Galls have been found sparingly on chalk hills, Surrey and Berks, on sand in Surrey, on granitic clay in Cornwall, and on Lias in Gloucestershire.

Prof. J. W. H. Harrison records it from Durham and N. Yorks, but "not common."

We know of it on *Rubus plicatus* (*fruticosus*), *caesius*, *rusticanus*, and other bramble spp., also on *R. idaeus*.

It is possible that further investigation will show that the insect attacking the raspberry is specifically distinct from the one on the brambles.

7. *Diastrophus mayri* Reinhard. We have no knowledge of this other than is contained in Cameron, Connold and Swanton.

8. *Xestophanes potentillae* Vill. This fly is probably widely distributed, but the galls may be overlooked unless searched for. They are abundant at Fetcham, Surrey, and seem to be plentiful round Leatherhead. It has also been recorded from Northumberland, North Yorks, and Durham (*Entom.*, November, 1916, and *Vasculum*, July, 1918). We also know of it from Derby, Devon, Essex, Kent, Middlesex and Yorks, near Scarborough.

It occurs on *Potentilla reptans*. It has been recorded on *P. procumbens*, Yorkshire (*Entom.*, January, 1916).

Experiments have been made at Fetcham to induce the flies to oviposit on *P. anserina*, but so far no galling has been detected.

9. *Xestophanes brevitorsis* Thoms. A smaller spherical gall, light yellow to brown in colour on the root stock or stems of *Potentilla erecta* Hampe. They may be single, or fused into an irregular mass up to 15 mm. in diameter and 30 mm. long. Plentiful in some districts. Records from Derby, Essex, Middlesex, Shropshire, Staffs, Surrey and Yorks, where it seems to be widespread on the moors of the River Derwent, though scarce in the Esk area.

10. *Aylax** *papaveris* Perr. The seed-capsules of *Papaver rhoeas* Linn. and *P. dubium* Linn. are swollen and distorted ; multicellular. These galls seem to be local, but are possibly frequently overlooked. We only possess records from Newhaven, Sussex (M. Niblett), and Leckhampton Hill, Gloucestershire (H. J. B.). Some more were shown at a meeting of the London Natural History Society a few years ago from a locality near London.

11. *Aylax minor* Htg. From the same two plants as the last species of fly. There seems to have been some doubt as to the specific rank of this insect, but it is now recognized as distinct (see *Ent. Mo. Mag.*, September, 1917, Dr. R. S. Bagnall).

Cameron records it for Britain. We have no personal knowledge of the gall at present.

12. *Liposthenes latreillei* Kieff. This species of gall has been known to Britain under the name of *Aylax glechomae* Linn. Dr. R. S. Bagnall (*Ent. Mo. Mag.*, September, 1917) states that the true *A. glechomae* of Linnaeus is only known from Sweden and Germany, and therefore all our records under this name really should be attributed to *L. latreillei*.

The gall is spherical, and occurs on the stems and leaves of *Nepeta hederacea* Trev. It is plentiful some years in certain localities, and then hardly seen for several seasons. It was abundant on Boxhill in 1927, and frequent on the North Downs, Surrey, in 1929. We have records from Derby, Shropshire and Yorkshire. Prof. J. W. H. Harrison says it is very rare in Northumberland and Durham (*Entom.*, November, 1916).

13. *Isocolus scabiosae* Giraud. On *Centaurea scabiosa* Linn. Fleshy swellings at the base of the stem or on the root-stock, usually composed of a number of spherical cells which may be fused together. When old the mass becomes very hard and woody.

Cameron recorded it only from near Buxton. We have records from Amberley, Sussex, Brockham Downs, Tothill, Fetcham and Bookham, Surrey ; also Durham (Dr. R. S. Bagnall, *Ent. Mo. Mag.*, December, 1917).

Specimens have been exhibited at times at the meetings of the London Natural History Society (see *Entom.*, October, 1927.)

The gall has also been recorded on *Centaurea nigra* Linn. from Durham (*Vasculum*, July, 1918).

14. *Isocolus fitchi* Kieff. Spherical swellings on the petiole or mid-rib of a leaf of *Centaurea scabiosa*. Does not seem to be common. First found by Mr. E. A. Fitch (see Cameron, iv, p. 204). We have only one record, which is of a group of cells found on the

* The genus *Aylax* is now being split up into five genera, as it has been found that there are definite groupings corresponding to the botanical affinities of the insects

South Downs near Amberley. It is recorded from Germany and France by Dr. Houard.

15. *Isocolus rogenhoferi* Wachtl. On *Centaurea scabiosa*. Swellings inside the bracts of the flower-heads, or of the achenes, 3 mm. to 6 mm. long. The bract galls can be readily detected by running one's thumb round inside the old head in the autumn.

Seems to have been added to the British list by Dr. R. S. Bagnall for Durham (*Ent. Mo. Mag.*, October, 1917; *Vasculum*, July, 1918, and December, 1919). Also recorded *London Naturalist*, 1923. for Harefield, Middlesex, and Tothill, Surrey, and in 1930 volume for Banstead and Bookham, Surrey, and for Staffs.

Mr. A. A. Dallman, of Doncaster, has found the gall in Yorkshire, and it may be expected from other places when searched for, as the host plant has a wide range in Britain.

16. *Isocolus jaceae* Schenck. Smaller swellings of the achenes of *Centaurea scabiosa*. The existence of this insect was suspected by Dr. Bagnall in Durham on *C. nigra* (see *Ent. Mo. Mag.*, October, 1917), and later it was found by Prof. Harrison on *C. scabiosa* in Durham (*Vasculum*, July, 1918). It has since been found in Surrey (M. Niblett) on *C. nigra*.

17. *Gilletia taraxaci* Ashm. Swellings in the mid-rib of leaves of *Taraxacum officinale* near the base. Added to the British list by Dr. Bagnall for Durham (see *Ent. Mo. Mag.*, September, 1917). In the October number Dr. W. J. Fordham recorded having found the gall in Derbyshire in 1902. Dr. Bagnall has since found it in Northumberland (*Vasculum*, July, 1918).

18. *Aulacidea hypochoeridis* Kieff. Elongated swellings up to 2 in. in length on the stems of *Hypochoeris radicata* Linn. Multi-cellular.

Used to be frequent some years near Wimbledon. Also seen elsewhere in Surrey, and in Yorkshire, Essex, Kent and Berkshire. Near Croydon (M. Niblett, *London Naturalist*, 1930). Prof. Harrison says it is very rare in Durham (*Entom.*, November, 1916).

19. *Aulacidea hieracii* Bouché. Elongated oval swellings on the stem, or roughly spherical swellings at the top of the stem of various species of *Hieracia*. Multilocular, green, but covered with fine white hairs when fresh. Cameron says it is of wide distribution in Britain and in Europe. Houard gives "Europe totale," and lists 14 species as host-plants. In Britain we know of it on *Hieracium boreale* and *sylvaticum* (Cameron), *boreale* and *vulgatum* (Connold), and *umbellatum* for Surrey and Yorkshire (H. J. B.).

20. *Aulacidea andrei* Kieff. On *Hypochoeris maculata* Linn. A small ovoid or fusiform swelling on the mid-rib of the leaf. Unilocular. There may be several galls on one leaf. Found by Dr. Bagnall in Essex, August, 1931 (see *Ent. Mo. Mag.*, November, 1931).

21. *Aulacidea pilosellae* Kieff. On the mid-rib of *Hieracium pilosella* (*vulgare*). Small unilocular swellings. See *Entomologist*, November, 1916. Prof. J. W. H. Harrison, as new to the British list from specimens found in Durham, and *Ent. Mo. Mag.*, October, 1916, Dr. R. S. Bagnall. Also *London Naturalist*, 1930, found near Headley, Surrey, Dr. Bagnall.

22. *Aulacidea pigeoti* Kieff. On *Tragopogon pratensis*. Roundish swellings on the stem about the level of the soil. Unilarval. Found by Dr. Bagnall in August, 1930, at Headley, Surrey (*Ent. Mo. Mag.*, October, 1930). Also taken by others in Surrey in various localities, and by Dr. Bagnall in Sussex, Staffs, Durham, and by Prof. Harrison in Durham.

23. *Aulacidea tragopogonis* Thoms. On *T. pratensis*. Elongated swellings on the stem about ground level. Unilarval. Dr. Bagnall and Prof. Harrison as above, from specimens found in Durham and Surrey. Also see *Vasculum*, November, 1930, p. 161.

24. *Aulacidea*? Spherical galls on the roots of *Hieracium vulgare*. Found by Dr. Bagnall in Staffs (*London Naturalist*, 1930, p. 19, and *Ent. Mo. Mag.*, November, 1931, p. 243).

25. *Phanacis centaureae* Foerster. Slight swellings in the stems of *Centaurea nigra* and *C. scabiosa*. Dr. Bagnall in Durham (*Ent. Mo. Mag.*, October, 1917, and December, 1917; *Vasculum*, July, 1918, and December, 1919). Also on the Hog's Back, Surrey, London Natural History Society.

26. *Harmolita graminis* Cam. Recorded by Cameron as a form of *Aulacidea hieracii* galling the roots of *Triticum repens*. It is now considered to be a good species (see *Ent. Mo. Mag.*, September, 1917, p. 201). We have no personal knowledge of this gall.

(To be continued.)

COLIAS CROCEUS AND *HIPPA RECTILINEA* IN SUFFOLK.—I saw a single specimen of *C. croceus* flying over the marshes just north of Aldeburgh on June 24th. My wife found a newly emerged female of *Hyloicus pinastri* on each of two successive days on the same pine-trunk on June 27th–28th in its Suffolk area. After finding the first of these, we dug for the pupa-case in vain. While searching the pines in the same area on June 26th, I found on a tree-trunk a *Hippa rectilinea*, the identification of which has been verified by Dr. Cockayne.—F. STANLEY SMITH (Capt.); Alpha Cottage, Datchworth, Knebworth, Herts.

COLIAS CROCEUS IN CORNWALL.—I saw a single *C. croceus* at Mullion on August 5th, and took a fine fresh female on the wing three days later, a cloudy morning with no sun.—C. GRANVILLE CLUTTERBUCK; 23, Heathville Road, Gloucester.

LYCAENIDAE IN MACEDONIA.

BY F. B. WELCH.

THE following Lycaenids were caught during the years 1925-27 in certain districts in Macedonia, chiefly those regions which had been occupied by the Bulgar armies in 1916-18, and lying N. of the railway line Doiran-Serres-Drama. These districts are:

1. The S. slopes of the Belasitza Range up to about 3000 ft. from the Lake of Doiran past Sveti Petka as far E. as the two Poroi.

2. The very similar country behind Serres up to the two Frash-tanis and Banitsa.

3. A group of villages on the west side of the plain of Drama, *i. e.* the E. and S. slopes of the Sminitsa massif from Alistrat to Prosochani, thence past Kalapot N. over the Studa hills to the upland plain of Zernovo, and as far as the Karaköi-Tarlis district, under Mts. Ali Butus and the Karadagh.

All this country is much the same: a line of villages surrounded by well-cultivated fields with poplars and walnuts on the hill slopes above the malarious plains; above this a belt of chestnut forest; above this again the pine belt, and lastly the bare limestone rocks.

In addition, butterflies were collected on the plains along the coast round the Gulf of Salonika from Sedes on the E. to the mouth of the Haliacmon River (Alabor), and up the lower course of the river to where it emerges from the hills, *i. e.* the Verria-Niaoussa-Vodena district, the last being very like the first three groups.

Heodes virgaureae Linn. At Karaköi at about 3000 ft. from the middle of July and into August. Subsp. *balcanicola* Graves.

H. ottomanus Lef. Sedes, Poroi, Kalapot. Various dates from April to August.

H. thersamon Esp. Common at middle altitudes, 700-1000 ft., *e. g.* Sedes, Egridere, Gornitsa, Sveti Petka, Kalapot, Frash-tani. First brood in May, second in July. In the second brood the tailed *omphale* is general.

H. dispar rutilus Wnbg. Two fresh males from Karaköi, 2800 ft., where it was fairly common.

H. alciphron Rott. Common at Banitsa and Florina, both above 2000 ft. in mid-June; normal specimens and *melibaeus* Stgr.

H. phlaeas Linn. Generally distributed and common from April to November. Darker forms as the summer advances until *aestivus* Zell. in late July and August, after which the unsuffused typical form reappears.

H. dorilis Hufn. Very common in the middle altitudes about 1000 ft. from April to October. Size drops to a minimum of 23 mm.

in August. Transitions to *orientalis* Stgr. were taken, and culminated in a female with upper side completely suffused taken at Sveti Petka in August along with unsuffused females.

Lampides boeticus Linn. Banitsa, worn, in June. Doiran, fairly fresh in September. Banitsa, October.

Syntarucus telcanus Lang. Widely distributed from Niaoussa and Sedes to Karaköi and Kalapot. First appears in May, second brood August, and lasts to the end of November.

Tarucus balkanica Frr. Abundant in the valleys, e. g. Verria, Prosochani, etc., in dry places in May and August.

Everes argiades Pall. Fairly widely distributed. Abundant at Doiran in September. Size about 23 mm. Female shows no trace of blue on upperside.

Plebeius argus Linn. Very common up to middle altitudes; especially numerous at Sveti Petka in August, where specimens varied from 22–27 mm.

Turanana vicrama M. (= *baton* auct.). Widely distributed from the foothills up to at least 2000 ft. in the coarse grass. Two broods end of March to May and July to September.

Aricia agestis Schiff. Generally common, the first taken being at Poroi on April 9th, 1926, and as late as October. *Calida* Bell. the only form from June to October.

A. anteros Frr. A worn specimen from Banitsa in June and abundant at Karaköi in August. Presumably confined to high country.

Polyommatus icarus Rott. Common and widely distributed, appearing from the third week in March until the beginning of November. The females show no trace of blue suffusion on the upperside. *Ab. icarinus* Scriba in a few cases.

P. meleager Esp. Very common at the end of July in fresh condition at Karloukova on brambles in a ravine at the foot of the chestnut forest. Also one fresh male from Sveti Petka end of August. Females of the blue form strongly suffused with brown.

Uranops amandus Schn. A fresh female from Verria in May, and common at Banitsa and Florina in June. Not below the 1000-ft. level.

U. dorylas Schiff. A male from Karaköi, July.

U. escheri Hb. Two fresh males from Egridere second week in June.

U. thersites Cant. (?). In the higher country, Banitsa, Karaköi, Karloukova and Kalapot, July and August.

U. bellargus Rott. Widely distributed except on the lowest levels. From May to October. Very little trace of blue suffusion at the base of wings in females.

U. coridon Poda. Various localities around Sminitsa on brambles in ravines at the base of the chestnut forests with *P. meleager*. July to October. The males are milky blue, the females brown with no blue suffusion, with the discal eye standing out clearly from a white spot. The undersides only slightly spotted, the ground-colour a warm brown. The black border to the upper-side of fore wings of males is rather broad.

Agrodiaetus admetus Esp. Two fresh males from Ziliahova, June.

Iolana iolas Ochs. A worn female from Vodena, May.

Cupido sebrus Hb. On the plains at Alabor Verria, etc., May and June. The underside is pale smoke-grey, but the discal spot 6 is usually absent as in *moreana*, though not invariably.

Cyaniris semiargus Rott. Fairly common in the country above 1000 ft., Karaköi, Banitsa, Vodena. Double spot in 1b absent.

Glaucopsyche cyllarus Rott. Taken in April and May in the lower localities mainly. The spots on underside of hind wing diminished or completely absent: *lugens* Caradja.

Maculinea arion Linn. Abundant at Karaköi mid-July. Rather dark, with well-developed eyespots.

Lycanopsis argiolus Linn. Common about the 1000-ft. level. First brood appearing at the end of March, rather small in size, going down to under 25 mm. Second brood in July: *parvipunctata* Fuchs.

Penyllan,
Charlton Kings,
(†)los

POLYGONIA C-ALBUM IN WEST SUSSEX.—Yesterday I caught a male *Polygonia c-album* sitting on a bramble leaf, basking in the afternoon sun, in a sedge on the bank of the River Rother. It is a perfect specimen of the usual type.—W. A. C. CARTER; Furze Reeds, Midhurst, Sussex.

[Little information as to whether this species has securely established itself in its newest quarters has come to hand so far this year. It may be of interest therefore to put on record a few observations dealing with 1929–1931 that have accumulated. Mr. Joseph Anderson, of Chichester, reported it as having been seen at Birdham, near that city at the end of October, 1931. On August 17th, 1931, Mr. E. Mannering took a solitary specimen on *Buddleia* in his garden at Brockley, S.E. 4. In the *Times* of October 10th, Mr. Howard wrote that he had seen it more than once in his garden in Kensington; and in *Nature* (October 26th, 1931) Dr. Dawe drew attention to its appearance again in his garden at Chiswick. In the Midhurst district it must be well established, for Mr. B. Barnes writes that he saw it on Redford Common on September 15th, 1929, and again the following day at Fernhurst.—ED.]

THE LIFE-HISTORY OF *HEMEROBIUS ATRIFRONS*
McLACH. [NEUROPTERA.]

BY FREDK. J. KILLINGTON, F.E.S.

THIS species is confined to coniferous trees, and has been taken from Scots pine, spruce and larch, with, perhaps, a preference for larch. Widely distributed in the British Isles, but apparently very local, it has been recorded from the following counties: Cornwall, Devonshire, Hampshire, Surrey, Berkshire, Oxfordshire, Essex, Nottinghamshire, Durham, Yorkshire, Inverness-shire, Galway and Westmeath. There are at least two broods in the year, the first in May and June, and the second in August and September: imagines may also be taken in July, but I am not able to say to which brood these belong.

From a female taken on August 29th, 1931, at Farley Mount, Hants, two eggs were obtained: these were laid on August 30th on two larch needles. One larva died soon after emergence, the other survived until the end of its larval life, dying soon after the cocoon had been spun, so that the following account of the life-history has had to be based mainly upon one larva. The food supplied during the whole period consisted of aphides from hawthorn, rose and nettles.

EGG.

Elongate oval, slightly flattened at the surface of attachment; length .75 mm., width .31 mm. Colour cream when first laid, except the micropylar knob, which is white throughout the egg-stage. Chorion smooth, but under a high magnification seen to be minutely pitted. In a few days the egg becomes more yellow, and just before hatching takes place the eyes of the embryo become visible as dark spots on either side behind the micropyle, while the body-segments give the egg an appearance of being transversely banded with faint brown or greyish brown. The eggs hatched on September 12th.

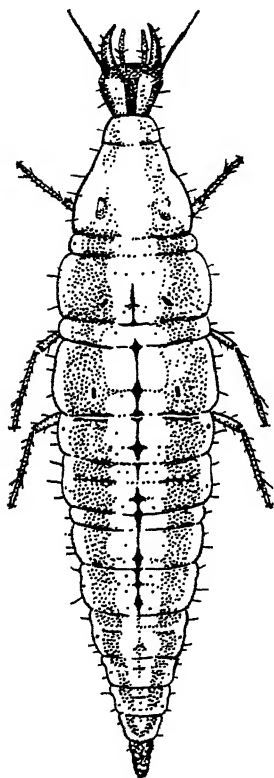
LARVA.

FIRST INSTAR.—At first the larva is wholly pale, but by the second day some indications of markings appear.

Head.—Mainly pale yellowish grey, with a cream Y-shaped line, the short stem of which arises from the middle of the posterior margin, the arms enclosing a somewhat darker grey elongated wedge. *Eyes* black. *Jaws, antennae and palpi* translucent smoky grey. *Body* cream or pale yellowish, tinged with reddish in the mid-gut region (the colour, however, depends to a large extent on the

food contents); faint reddish and brown longitudinal latero-dorsal bands can be seen. The first moult occurred on September 18th.

SECOND INSTAR.—In this instar the larval markings resemble those of the final instar. The second moult occurred on September 23rd.



Hemerobius atrifrons McL.
3rd instar larva. Actual
length 8 mm.

THIRD INSTAR.—*Head*: Pale greyish cream, with a median dark brownish grey wedge-shaped mark, which has its apex before the centre of the posterior margin and its widened end reaching the anterior margin. Laterally the head is dark brownish grey, so that, viewed from above, the head appears to have three dark longitudinal bands. The median wedge is bordered by a narrow pale line, which, when the head is fully extended, is seen to be part of the Y-shaped line referred to in the description of the first instar larva. *Eyes* black. *Antennae* blackish, the short basal segment the darkest. *Jaws* dark brownish grey, castaneous apically. *Palpi* smoky grey.

The *body* is greyish white along the mid-dorsal area, cream-white at the sides, with two longitudinal rather pale dull madder-red latero-dorsal bands; at the sutures and folds the colour is decidedly darker in tone. Segments 9 and 10 of the abdomen are almost wholly reddish brown. The bands on the abdomen are not made up of triangular segmental blotches as in *Hemerobius stigma* Steph., but are more regular and unbroken. There are three pairs of thoracic sclerites placed in the latero-dorsal bands; the prothoracic sclerites are ochreous grey, edged with cream, oval in shape, but with the axis curved so that they are somewhat crescentic; the meso- and metathoracic sclerites are blackish, edged with cream. From the mesothorax a pulsating median dorsal line runs towards the anal extremity of the abdomen, being blackish on the metathorax and first three or four abdominal segments, and then becoming paler and redder as it approaches the end of the body. Laterally there is a slight trace of a reddish subspiracular line. Ventral surface pale grey.

Legs translucent smoky grey, trochanters pale; a conspicuous black line at the apex of the femora; tibiae and tarsi scarcely darker than femora.

Total length of larva, 8 mm.

The cocoon was spun on October 11th.

SUMMARY OF LIFE-HISTORY.

Egg laid : 30.viii.1931.

Egg hatched : 12.ix.1931.

1st moult : 18.ix.1931.

2nd moult : 23.ix.1931.

Cocoon spun : 11.x.1931.

Imago, 1st brood : May, June, ? July.

Imago, 2nd brood : ? July, August, September.

Females swollen with eggs have been taken at the beginning of June and the end of August.

Hope Department,
University Museum,
Oxford.

LIMENITIS SIBYLLA IN KENT.—A further record of the occurrence of *L. sibylla* in Kent comes from Canterbury, where a specimen was taken in a garden on August 3rd last. The nearest woodland is about a mile distant, but I have no knowledge of the presence of the insect there. The species is known, however, to occur in a wood six miles away.—WM. E. BUSBRIDGE; 1, Bushy Avenue, Crofton, near Orpington.

LIMENITIS SIBYLLA VAR. *NGRINA*.—On Monday, July 25th of this year I took a *Limenitis sibylla* var. *nigrina* on the public footpath of Highwoods near Bexhill. It has a small piece out of the lower margin of the lower wing, also a small hole in the left-hand lower wing. A few weeks earlier, on July 9th, I captured an example of *Aphantopus hyperanthus* var. *caeca* on the Cotswolds near Birdlip in perfect condition.—J. JACKSON; 2, Crossways Mansions, Bexhill-on-Sea, Sussex.

COLIAS CROCEUS IN WEST SUSSEX.—I can add a few records to Mr. Harold Hodges's (see p. 209). Between August 1st and 20th I have seen the species at Selsey on several occasions, and also at Goodwood and at Sidlesham. There seem to be a good many about. *Vanessa urticae* (see p. 165) is abundant, but *Pyramis atalanta* scarce and *P. cardui* apparently absent here this year. *Plusia gamma* is very common. Never have I seen the three species of *Pieris* so abundant; they are flying literally in thousands, some of the rough fields appearing almost white with them. *Pararge megera*, too, which is seldom plentiful here, has suddenly reappeared in considerable numbers during the last two or three days.—N. D. RILEY; Beverley, Selsey, near Chichester.

NOTES ON REBEL AND ZERNY'S "LEPIDOPTEREN-FAUNA ALBANIENS."

BY CAPT. A. F. HEMMING, C.B.E.

IN this important faunistic study* Dr. Rebel and Dr. Zerny give a detailed systematic account of the Lepidoptera of Albania, based mainly on the collections made by the expedition, consisting of Dr. Arnold Penther, Dr. Zerny and Herr Karl Predota, which the Akademie der Wissenschaften of Vienna dispatched to north Albania in 1918. The importance of these collections, which contained over 8000 specimens, may be judged by the fact that of the 900 species taken, 500 proved to be new to the fauna of Albania. By drawing on the records of previous collectors, the authors have been able to list 1500 species for this region. No doubt, further work will disclose the existence there of many others, but the material now brought together is sufficient to enable one to judge the general character of the fauna. The analysis with which the paper opens shows that broadly speaking it consists of two evenly balanced elements, euro-siberian and ponto-mediterranean, each of which accounts for 41.2% of the total number of species taken. These main groups are supplemented by minor groups of allied affinities, the former by alpine (4.3%), and boreal-alpine species (2%), and the latter by mediterranean (9%) and pontic species (2.3%). Having regard to the climate of Albania and its geographical position, it is perhaps a matter for surprise that species having southern affinities (52.5%) should only so slightly exceed in numbers those of a northern origin (47.5%).

As in previous papers by both authors, a conservative attitude has been adopted in regard to generic nomenclature, and no doubt pending a thorough revision of this intricate subject this decision was wise. It certainly serves to render more easy comparison with existing papers dealing with the Lepidoptera of south-eastern Europe. As regards specific nomenclature, however, the authors have evidently been at great pains to embody the results of studies by various authors on particular species. The result is a catalogue more accurate and more illuminating than has yet been published in regard to any area in Europe.

The section dealing with the Rhopalocera, with which alone it is proposed to deal in this note, contains a list of 167 species, and includes many records of great interest. For a number of species, for example, the north-western boundary of their area of distribution is considerably extended. Thus, *Pieris krueperi* Stgr. (1860), *Euchloë gruneri* H.-S. (1851), and *Carcharodus orientalis* Reverdin (1913), the western limits of which had previously been

* Rebel and Zerny, 1931, *Denkschr. Akad. Wiss. Wien*, 103: 37-162

Macedonia, are all shown to occur in Albania. In the Nymphalidae it is interesting to note that the expedition took in Albania both *Argynnis pales* Schiff (1775), where it was represented by a new subspecies (ssp. *contempta* Zerny), and the subspecies *balcanica* Rebel (1903) of the allied species recently separated by Higgins (1930) as *Argynnis graeca* Stgr. (1879). In the Satyridae both species of each of two pairs of linked species were taken, viz., *Mannola lupinus* Costa (1832-40) and *M. lycaon* Rott. (1775), and *Nythia fagi* Scop. (1763) and *N. syriaca* Stgr. (1871). From the material which I have examined, it appears that the last-named species, which is usually regarded as an asiatic species, occurs over a wide area in south-eastern Europe, including Albania, Yugoslavia, Macedonia, Thessaly, Corfu, Roumania and Turkey-in-Europe. In this family the most interesting addition to the fauna of Europe is *Eumenis geyeri* H.-S. (1846), of which a new subspecies (ssp. *occidentalis* Rebel & Zerny) was discovered by Drenowski in July, 1918, on the Galičica Planina (in Albania), at an elevation of between 5250 and 6250 ft. This was a quite unexpected discovery, as previously this species was known only from north-east Asia Minor, Armenia and Kurdistan. Other Satyrids of which new subspecies were taken were *Eumenis briseis* Linn. (1764), *Coenonympha gardetta* Prunner (1798) [= *satyrion* Esper (1805)], and the species usually known as *Pararge hiera* Fab. (1777). The latter name, however, as Verity (1929) has pointed out, applies to the Rhineland subspecies of the closely-allied species *P. maera* Linn. (1758). The oldest available name for the present species is *petropolitana* Fab. (1787). I have discussed these forms in detail in a recently published paper (Hemming, 1931, *Trans. Ent. Soc. Lond.*, 79: 503). In the Lycaenidae the most interesting records are those of *Everes decolorata* Stgr. (1886) which is, however, the western subspecies of *E. decolor* Stgr. (1886), and not a separate species, and *Philotes vicrama schiffmulleri* Hem., which in 1929 I showed, was a species quite distinct from *P. baton* Bergst. (1779). In the Hesperidae, a new subspecies (ssp. *fulminans* Rebel & Zerny) is described of *Thymelicus flava* Brun. (1763), the oldest name for which species is, however, *sylvestris* Poda (1761). In the group of species usually placed in *Hesperia* Fab. (1793) there are two records of special interest, viz. *H. foulquieri* Oberth. (1910), previously known only from the south of France and from Italy, and *H. cynarae* Boisd. (1840), the nomino-typical subspecies of which had previously been taken in Europe only in Macedonia.

The paper is accompanied by a good plate illustrating new forms, an excellent map, and an admirable gazetteer of place-names. Both in substance and in form it is in every respect a model of what a faunistic paper should be.

PYRAMEIS ATALANTA IN WINTER.

BY W. G. SHELDON.

Up to comparatively recent times the opinion was generally held by lepidopterists that the whole of the *Pyrameis atalanta* seen in Britain were of native origin, and that a sufficient number of imagines successfully hibernated each winter to restock the country in the following summer.

Some thirty or more years ago, however, many observers began to doubt if *atalanta* had the power to hibernate successfully in Britain, and formed the opinion that our stock was entirely dependent upon immigration.

Following this period, many notes appeared in this and other magazines of occurrences of the butterfly in winter in Britain, and then a few instances of undoubted attempted hibernation were discovered. On the other hand, instances of immigration were noted, and now I suppose the prevalent view is that this butterfly can and does attempt to hibernate with us in small numbers, but that the British stock is kept up almost entirely by immigration, the immigrants usually arriving at the end of May or early in June.

As there does not seem to be any doubt but that the vast majority of *atalanta* seen in Britain are the result of immigration, the crux of the whole matter obviously is, *What does it do, and what is it capable of doing in winter on the shores of its true home, the Mediterranean?* If it habitually hibernates there for the whole of the winter, then there is no reason to think it is not capable of doing so with us in Britain, but if it is continuously brooded on the Mediterranean, and has not acquired there the habit and power of hibernation, then obviously it is not likely to be able to accomplish this in Britain.

The reason for these notes arises out of some observations I made on *atalanta* whilst on a visit to North Africa from November to January last.

These observations were as follows: I spent the last few days of November at Tangier in Morocco, and whilst there saw one or two imagines of *atalanta*, and found a few larvae, obviously feeding and not hibernating.

On December 3rd, travelling overland, I reached the town of Algiers, where I stayed eight days. Here at first the weather was brilliantly fine and warm, and butterflies, including *Pyrameis atalanta*, *P. cardui*, *Colias croceus* (*edusa*), *Pararge egeria*, *P. megera*, *Pieris brassicae*, *P. rapae*, some other Pierids, possibly *P. daphidice*

or *Euchloë belemnæ*, or both species, and some Lycaenids, which I did not identify, as I did not take out a net, were newly emerged and in good condition. In the daytime the shade temperature was about 75°, and in the evening, in my bedroom, about 62°. The weather remained fine and warm until December 8th, when it completely broke up, and there was continuous cold rain and wind for several days.

On December 11th, as there seemed no prospect of fine weather and warmth at Algiers, which was what I had journeyed from home for, I decided to move on to Biskra on the edge of the Sahara, some three hundred miles south-east of Algiers, where I expected to find sun and warmth. I did find sun at Biskra, but not warmth, and with the exception of a few worn *cardui* and an occasional *rapæ*, butterflies were not seen. The weather was abnormally cold all over Algeria at this period, and everything of over 2000 ft. altitude—and much of Algeria is over this altitude—was covered with snow.

At the end of December and during the first week in January I was again at Algiers; the weather, though cold, was on some days sunny, and a certain number of butterflies were seen, including a few *atalanta*, *cardui*, *brassicæ* and *egeria*. *Atalanta* larvae of all sizes were very common, and were feeding. I gathered a number, but all were parasitized, and not a single imago emerged.

My experience of *atalanta* on the shores of the Mediterranean not being sufficient to enable me to form a definite opinion as to its winter habits, on my return to England I wrote for information on this point to Mr. Harold Powell, for many years resident at Hyères in the south of France, but now living at Meknes in Morocco.

It is hardly necessary to say that Mr. Powell, who is one of the very best observers we have, knows far more about the Lepidoptera of the south of France and Northern Africa than any other living lepidopterist. This is the information he has given me respecting the winter habits of *atalanta*:

“My experience with *atalanta* in Northern Africa and Southern France is that it is continuously brooded. The autumn emergences continue to live for a long time; I have seen them on warm days in December and even January, but I do not think they live right through the winter. At the same time larvae may be found, as you found them at Algiers in December and January, and as I also found them here at Meknes, where the species is not common. I found two young larvae (3rd stage) on January 29th last on a very fierce nettle which is common on old rubbish-heaps and along hedges; they were not hibernating, as there were plenty of traces of feeding. These larvae, with the resultant pupae, were kept in natural conditions out of doors; the imagines emerged in March,

and they were probably not the very earliest specimens of that generation to emerge. In 1929 I bred a specimen towards the end of May from a larva found near Meknes; this was probably a second-brood example. I am less certain what happens at the height of summer here.

"It seems reasonable that *atalanta* should more resemble in its winter habits *cardui* than *polychloros*, *antiopa*, *urticae* and *io*, all of which do hibernate here, as it is so much more nearly related. At Meknes *cardui*'s winter habits appear to be the same as those of *atalanta*; the autumn specimens live well into the winter, whilst larvae may be found at the same time."

Now let us see what *atalanta* does in the winter in Britain when under continuous observation. It is unfortunate that the great majority at any rate of the specimens found hibernating, or trying to hibernate, have not been kept under *continuous* observation in order that the length of their life could be ascertained, and if they were successful in living through the entire winter and remaining sufficiently vigorous in the spring to procreate their kind. There is one observer, however, Mr. L. W. Newman, who has repeatedly endeavoured to hibernate *atalanta*, and who has kept numerous examples under observation for lengthened periods, and these are the conclusions he comes to, as communicated to me in a letter dated February 13th last:

"Your letter confirms what I have always said with regard to *atalanta*—that we are entirely dependent upon immigration for this species, though of course in exceptionally mild winters a few may survive in the extreme south, Cornwall, etc.

"Several times I have tried to hibernate this butterfly, but my specimens always died in December or January *if not regularly fed*, but if fed regularly all the winter they could be kept alive for long periods; however, they seldom lived through the winter, usually dying in March. I found that if they were put in a muslin-covered box and kept in a living-room on the window-sill, and fed by means of a pad soaked in honey and water, on most sunny days they would feed and fly about, but if the weather was cold and dull they would remain quiet for many days."

It therefore would seem that as *atalanta* has not acquired the habit of going into hibernation in its home on the Mediterranean, and as practically all our stock immigrates annually from there, it is extremely unlikely that it can do so here, though, as Mr. Newman writes, and as has been proved by others, it may survive through a winter in very small numbers, if conditions of weather or locality, or both, are favourable.

West Watch,
Oxted, Surrey;
August 8th, 1932.

NOTES AND OBSERVATIONS.

COLIAS CROCEUS IN WEST SUSSEX.—On August 6th I saw a *Colias croceus* flying over the Downs near Rogate. I think it was a male. Butterflies in this district seem generally to be very few.—HAROLD HODGE; 9, Highbury Place, N. 5.

IMMIGRANT LEPIDOPTERA.—S.E. Union of Scientific Societies' Immigration Scheme.—Records are disappointingly few for this month, but whether due to a lack of immigrants or to a lack of observers I am unable to say.

Pyrameis atalanta L. One specimen at Baddesley, near Southampton, 19.vii.32 (W. Fassnidge).

Pyrameis cardui L. Single specimens seen near Southampton, 16.vi.32, 18.vi.32, 19.vi.32, 26.vi.32 (W. Fassnidge). One specimen taken on the top of St. Catherine's Hill, near Winchester, 2.vii.32 (M. Woodley). One specimen, very worn, near Margate, 8.vii.32 (Siviter Smith). One specimen, very worn, at Herne Bay, 3.vii.32 (Siviter Smith).

Plusia gamma L. Two ♂♂ and one ♀ in poor condition at Lower Guiting, Gloucestershire, 12.vi.32 (Siviter Smith). A fair number flying over the heaths near Lyndhurst during the five days preceding 20.vii.32 (Claude Morley). Five or six nightly at light at Littlehampton (Major Jeddere-Fisher). It may be worth recording that I have not myself seen one specimen in the Southampton district during the month under review.

Plutella maculipennis Curt. A specimen every few steps on St. Catherine's Down, Winchester, 12.vii.32 (W. Fassnidge). Hundreds seen on Farley Down, near Winchester, 10.vii.32 (W. Fassnidge). About fifty seen on Southampton Common, 15.vii.32 (W. Fassnidge). The species appears to be more or less common everywhere near Southampton.—W. FASSNIDGE (Recorder); 47, Tennyson Road, Southampton.

BUTTERFLY MIGRANTS.—I have received a letter from L. G. Sharman, a regular observer of migrant birds for Norwich Castle Museum, serving on board the East Dudgeon Light Vessel, situated 22 miles N.E. of Blakeney Point, Norfolk. stating that for three successive years on a single quiet warm day in mid-June he has noted a migration from east to west of the Large White butterfly. Last year they were flying all day in an attenuated stream about thirty to the hour 50 ft. above water, but this year, so far, none have been seen, though watched for. As regards other migrant insects, he writes about *Pyrameis cardui* that he is "positive that I have never seen it near this coast, though in the autumn I have seen quite a few Small Tortoiseshells and Red Admirals, say some four or five, resting on board, but whether on migration or not I do not know. We get all kinds of insects on board here, but only when the wind is between south and W.S.W. and probably blown off shore" (but with east winds he has recorded migrating *Hirundae* hawking flies). Some three years ago he caught a Death's-head Hawk moth on board upon

the same date as another was captured in the Cromer Knoll Light Vessel, and other species of Hawks have been seen but not recorded.—T. DANNREUTHER, Capt. R.N.

SPHINX LIGUSTRI TWO YEARS IN PUPA.—I believe it is very unusual for *S. ligustri* to remain over a year in the pupal state. Three larvae which pupated in 1930 all produced perfect imagines during the last half of June, 1932, after being in the pupae twenty-two months. I may add that my friend Baron Bouck also has three or four pupae of the same strain of 1930 larvae which have not yet emerged.—F. W. FROHAWK; July, 1932.

LOCAL ABUNDANCE OF TORTRIX VIRIDANA.—Although there appears to be a general scarcity of *T. viridana* in most localities where it usually occurs, I have never met with a greater profusion of this species than during last month (June) at South Godstone, Surrey. The oak trees (including those isolated along the roadways) were completely denuded of all foliage; in most cases not a single leaf remained on the largest trees. The moths were in such countless myriads that they swarmed in clouds beneath the trees, and every puddle of water by the roadside was densely strewn with them. I understand that after the storm of rain and wind the gutter-pipes of the houses near the oaks became blocked with the dead moths which were swept from the roofs by the wind and rain into the guttering.—F. W. FROHAWK; July, 1932.

"HUNTING INSECTS IN THE SOUTH SEAS."—*Re* the criticism of Miss Evelyn Cheesman's book, *Hunting Insects in the South Seas*, in the August number of the *Entomologist*, I would like, in defence of the author, to make a few remarks. First, the meal she describes at a "little Chinese store, washed down with native coffee," was obviously made under great pressure of hunger and thirst, for no doubt it would need that to face the horrors of a "Chinese store." But the "native coffee" would at least have been pure coffee, unadulterated with chicory. And perhaps the same dire necessity was compelling the kingfishers to devour *Danaida plexippus*. About the "crimson lilies which opened at the breath of the Convolvulus Hawk Moth," I can say nothing from personal experience, except that to one who knows the marvels forever unfolding themselves in a tropical jungle no "imagination" is required, especially in the strange and wonderful relationships which exist between plants and insects. But the sentence in the criticism, which speaks of the "breath" of the Hawk Moth causing the lily flowers to open, is not even quoted correctly; the word "breath" is not used at all; it is "the soft current of air from the moth's wings" which appeared to cause the opening of the buds. Also this is only suggested by Miss Cheesman as a possible solution, and what would seem, from her previous description of it, a very plausible one. And now I can at least assert with absolute certainty that the eggs of *Hypolimnas bolina* are not infrequently deposited on the bare earth, as well as sometimes on a minute leaf, barely visible above the soil, and sometimes

where no leaf at all is as yet there. I have bred this butterfly in India, the Philippines and Fiji Islands, and though its food-plant, *Synedrella nodiflora*, grows to a rank weed, never have I seen a wild female lay on anything but the tiniest plant she can find, or on the bare ground.—MARGARET E. FOUNTAINE.

[The Editor himself was responsible for the review to which Miss Fountaine refers; but he never anticipated that his remarks were such as to call forth a champion for Miss Cheesman's cause. He rather thought he was that himself. Surely both Miss Fountaine and the author will forgive him if he "improved" on the *Convolvulus* Hawk-moth observations; the temptation was very great. As to the egg-laying of *Hypolimnas bolina*, it is most gratifying to have Miss Fountaine's independent and complete confirmation; it would have been even better had either observer been able to confirm her apparently very well-founded suspicions about the presence of the seedlings hidden where the female laid her eggs on the bare ground. But the matter of the coffee is in another category. No doubt it was good, and it did in fact wash down an excellent meal, and not, as Miss Cheesman wrote, the Chinese store.—ED.]

BUTTERFLIES IN THE EASTBOURNE DISTRICT.—Owing to the very cold April and May the spring butterflies have been very scarce in the Eastbourne district, and late in emergence. The first *Brenthis euphrosyne* and *Euchloë cardamines* were not seen until May 26th. *B. selene* was not out until the middle of June, and then very scarce. A few *Pyrameis cardui* were seen on May 29th and larvae were subsequently reared. *Agriades corydon* appeared about the usual time, July 14th, but up to the present the emergence has been very small in comparison with the past few years. On August 7th I saw about a dozen *Colias croceus* in one of the fields on the Downs, and on August 11th the town was invaded by large numbers of *Pieris brassicae*, which swarmed in all the gardens. *Vanessa urticae* larvae are in great profusion.—S. A. CHARTRES; 4, King's Drive, Eastbourne.

JUNE EMERGENCES.—June was a month of sunshine; except on the last day rainfall was negligible. Till the 24th nights were mostly cool, during the final week mild and cloudy. Though conditions are now normal, the backwardness of early spring still shows its effects in late emergences. This is especially the case with Noctuas. The *Plusias*, an exception, appeared towards the end of the month, when *Viola* was in full bloom: *Plusia pulchrina* on the 23rd, *P. chrysis* on the 28th, and *P. festucae* the next day. I did not see *P. iota* till July 1st, and *P. moneta* till a week later. *P. gamma* reached here on June 30th. I had *Acronycta psi* emerge in captivity on June 5th, but the pupa had passed the winter in a room heated by a radiator. I did not see *psi* in the open till the first week of July. *Demas coryli* appeared on June 9th. Other Noctuas which appeared before the last week of the month were: *Grammesia trigrammica* (5th); *Noctua rubi* (9th); *Mamestra genistae* (20th); *Rusina tenebrosa* and *Mamestra oleracea* (23rd). Ten further species, all fairly common, appeared during the last week. A few more dates are: *Perizoma flavifasciata*

(2nd); *Eustroma silaceata* (4th); *Selenia lunaria* and *Iodis lactearia* (15th); *Heptamelus lupulina* (24th); *Timandra amata* and *Bapta temerata* (26th); *Lydella adustata* and *Phalerus bucephala* (27th); *Smicrinthus populi* (29th). On the 22nd I took *Palimpsestis fluctuosa* at light; this is a recognized locality for the species, but I had not previously taken it.—E. P. WHITCOMBE; Bewdley, Worcestershire. July 22nd, 1932.

RECENT LITERATURE.

Bees, Wasps, Ants and Allied Insects of the British Isles. By EDWARD STEP, F.L.S. (With 44 coloured plates, 67 plates of photographic reproductions and 64 figures of neurulation.)

To use the author's own words, this "book is not intended for those who desire more than a general knowledge of the many groups and some of the commoner species . . . this is a book for the Rambler and field naturalist." For these this work will be found quite satisfactory, and they may consider themselves fortunate in that the text is for the most part free from errors, and much of it very interesting reading. While the numerous plates furnish excellent and often beautiful figures of the species represented, and many details of habits and life-history are also illustrated. Everyone who takes an interest in all kinds of British insects should obtain this book.

The specialist of this Order of Insects will, however, regret the unscientific arrangement of the creatures dealt with, as nothing appears to be gained by this. The social wild bees or Bombi are separated not only by the social wasps (*Vespa*), but also by the solitary ones and by whole groups of the Fossorial species from the rest of the bees. It would have been admissible to keep all the social Aculeata together, especially if one wished to make some comparison of the various degrees of perfection of the social habits in the different groups, but this division into social and non-social Aculeates has not been maintained, for the Ants, with their high social development, are far separated from either the Bombi or the Vespae. In the section headed Wood-boring Wasps a most incongruous association is found of insects utterly remote both in structure and habits, viz. the Sphecoid wasps of the genus *Trypoxylon* with the Siricidae and Cephidae belonging to the Phytophagous or sawfly suborder. Some of our parasitic bees are dealt with under the heading "Homeless Bees," but others (e.g. *Psithyrus* and *Coelioxys*) are treated in connection with their hosts. The genus *Stelis* is apparently omitted, though structurally and in some points of habit it is a most interesting form. The question of the parasitism of *Sphecodes* is said to be "still unsettled," but this is quite erroneous, for its positively parasitic habits have been well known for many years, and of nearly all the British species and of many foreign ones the actual hosts are now well known. Step finds fault with this generic name, forgetting that many insects formerly called *Sphecs*, such as *Tachysphex*, *Pompilus*, etc., have exactly the coloration as, and in life a great superficial

resemblance to some *Sphecodes*. In writing of *Gorytes latiminctus* and *biminctus* he says (as though in doubt of their being true natives) that "though included in the British list, they appear to have been taken here on only a few occasions." Both species have a wide distribution in the south of England, from the Eastern counties to Devon and Cornwall, and both have been taken in numbers in some of these. *Cerceris 4-cincta*, of which colonies existed for many years at Colchester, and which also occurred in various localities in Kent, is considered to be probably an accidental visitor from the Continent! "There are three species of *Diodontus*" and "*Psen pallipes* is our only representative of the genus" are incorrect statements, as there are two species of *Psenulus* (*Psen*) and four of *Diodontus*. Also the ♂ of *Procnemus pusillus* has not an "entirely black abdomen," but is red and black. These and other such mistakes certainly need correcting.

In the text 174 of the 220 pages dealing with the insects and their habits are almost wholly occupied by the "Aculeata"; the remaining 46 contain a brief account of the "Ichneumons," "Chalcis flies," "Sawflies" and "Gall flies." Under the Ichneumons, however, are figured and described some "Chalcis flies," which we are told are regarded by some classifiers as a section of Ichneumons—a totally impossible classification, for which we know no authority. Then under "Chalcis flies" we read that the Braconidae and Proctotrypidae are the families to be considered, but these families are, of course, not Chalcis flies at all. Similar mistakes occur in the naming of some of the excellent figures of neurulation given at the beginning of the book, where the wings of *Prestwichia* and *Polynema* are given as an "Ichneumon's," as also are *Proctotrypes* and *Telenomus*.

At the end of the book will be found a reasonable classification of the families of insects dealt with in this work—a very necessary appendix, owing to the curious mixture and order of groups adopted in the body of the work. There are occasional misprints here (as elsewhere). Thus Formicoidae was evidently meant for Formicoidea, and Braconoidae presumably for Braconoidea, but why the Ichneumonoid family Braconidae is given superfamily rank is incomprehensible, since it is very closely allied to the Ichneumonidae.

The plates, whether coloured or other, are excellent, though in some the colours are hardly bright enough. There appear to be some errors of determination of the species figured. Thus the worker and female of Cullum's *Bombus* (Pl. 4) have no resemblance to the author's description, and are more likely to have been made from the race *proteus* of *B. soroensis*—a race not known in Britain. The figures of some of the more minute insects should have been more enlarged or omitted. Thus three species of *Passaloecus* are figured, but no specific characters are evident in the figures. Indeed, even in specialists' collections, the species of this genus are frequently confused, so it could not be expected that the figures on the plate would enable anyone to distinguish them. It would have been far better to replace four of these figures with those of the common but highly interesting genera *Astata* and *Tachysphex*. The invention of English

names, such as "the Sand Tailed-digger" (*Cerceris arenaria*), "The puffed-up Robber-wasp" (*Harpactus tumidus*), etc., appears to us a mistake, and these are not the least likely ever to come into use. What is called "Gooden's Nomad" (*Nomada goodeniana*) should have been called Goodenough's Nomad, the name of this botanist and entomologist having been thus shortened by Kirby, no doubt for the sake of euphony.

The real value of this work lies in the collected accounts of the habits of a large number of species and the abundance of good illustrations, and we much regret that no such excellent a book existed or indeed was possible when we began to collect and notice the Hymenoptera nearly fifty years ago. At that time the only readable account of the Aculeata with a fair number of figures was Shuckard's *British Bees*, the price of which (10s. 6d.) was the same as Step's much more helpful book.

R. C. L. P.

The Butterflies of the District of Columbia and Vicinity. By AUSTIN H. CLARK. Smithsonian Institute, U.S. National Museum Bulletin 157. Pp. 338. 64 plates.

The author enumerates 92 species as occurring in his district, and gives a fairly long list of others which ought or might be expected to turn up there as well. The region is one of singular faunistic interest through being the meeting-ground for northern and southern, mountain and coastal plain forms and species, as is well demonstrated in the detailed account of the individual species which comprises the bulk of the volume. The Satyrid butterfly, for example, *Cercyonis alope*, is found in three distinct races, the northern coastal form *maritima*, the northern inland form *alope*, and a southern mountain form, and there is good reason for believing that a fourth form, the southern coastal *pegala*, is also there. This interest, and also the desire to put on record the fauna of to-day before it is swept away by the rapidly expanding suburbs of Washington, seem to have stimulated Austin Clark to undertake and carry through, when not on duty as Curator of Echinoderms in the U.S. National Museum, a work which, primarily faunistic, is yet also most valuable for the great wealth of recorded observations upon a wide range of butterfly habits and behaviour. There is little concerning life-history in the usually accepted sense of that term, but upon times of occurrence, special habitats and tricks of particular species there is a tremendous amount of information; and the author's often most original interpretations of observed phenomena provide not the least attractive reading in his book. The gatherings of butterflies to drink at mud-puddles are familiar to most lepidopterists. They are usually "explained" by attributing to the insect a desire for moisture, or perhaps dissolved salts or other animal matter. Austin Clark likens them to the "pubs" to which humans are apt to withdraw when seeking quiet and rest from worldly troubles. He maintains that only the newly emerged "young bachelors" frequent them, and then only when the species to which they belong are unusually numerous—too numerous in fact, so that some, unable to cope with the strain of

life in the open fields and hedgerows, take, like humans as it were, to drink! In the case of other species, in which the gregarious passion for "puddle-clubs" is undeveloped, the surplus males will always be found flying about roadsides and away from the fields, where the females and the more successful males disport themselves. By an extension of the same theory he explains the seemingly so aimless migrations of many Pierids, the swarms of which are almost entirely composed of fresh males. "In many species of butterfly," he says, "the males, if they increase beyond a certain number, seem to be unable to live together peacefully in the presence of females, although they are perfectly well able to do so in areas devoid of females." And in support of his belief that the moisture of the puddles cannot be the real attraction, he asserts that "puddle butterflies will collect shortly after a rain, when there can be no question of sufficiency of water in the fields. No matter how dry the country may be, however no puddle butterflies will be seen unless the puddle species are common." That the old explanations of the puddle groups are inadequate is generally admitted, but to what extent Austin Clark's theory can be accepted time alone can tell. Observations upon other species elsewhere might prove of considerable interest. There is not space to deal with the many other interesting aspects of butterfly life upon which the author touches, such as migration, pressure of population, extirpation of one species by another, odours and emanations, but enough has been said perhaps to indicate that this is no dull faunistic paper, but a book well worth reading.

Proceedings of the South London Entomological Society, 1931-32.

The present volume, which marks the sixtieth year of the Society's existence, is well up to the usual standard. The papers are not numerous, yet of considerable interest. notably the contributions of Dr. Cockayne and C. N. Hawkins towards the solution of the vexed question of the systematics of *Dysstroma truncata* and *concinata*. A. E. Tonge continues his illustrated account of the eggs of the British Lepidoptera, dealing with the Noctuidae; and H. J. Turner contributes a paper on the classification of the Plume Moths. Some quite entertaining pages are those written by E. Step in preparation of the presidential address he was never to deliver, giving an account of the early history of the Society. The meetings, judging by these reports, appear to have been as interesting and well attended as ever, and the Society as flourishing.

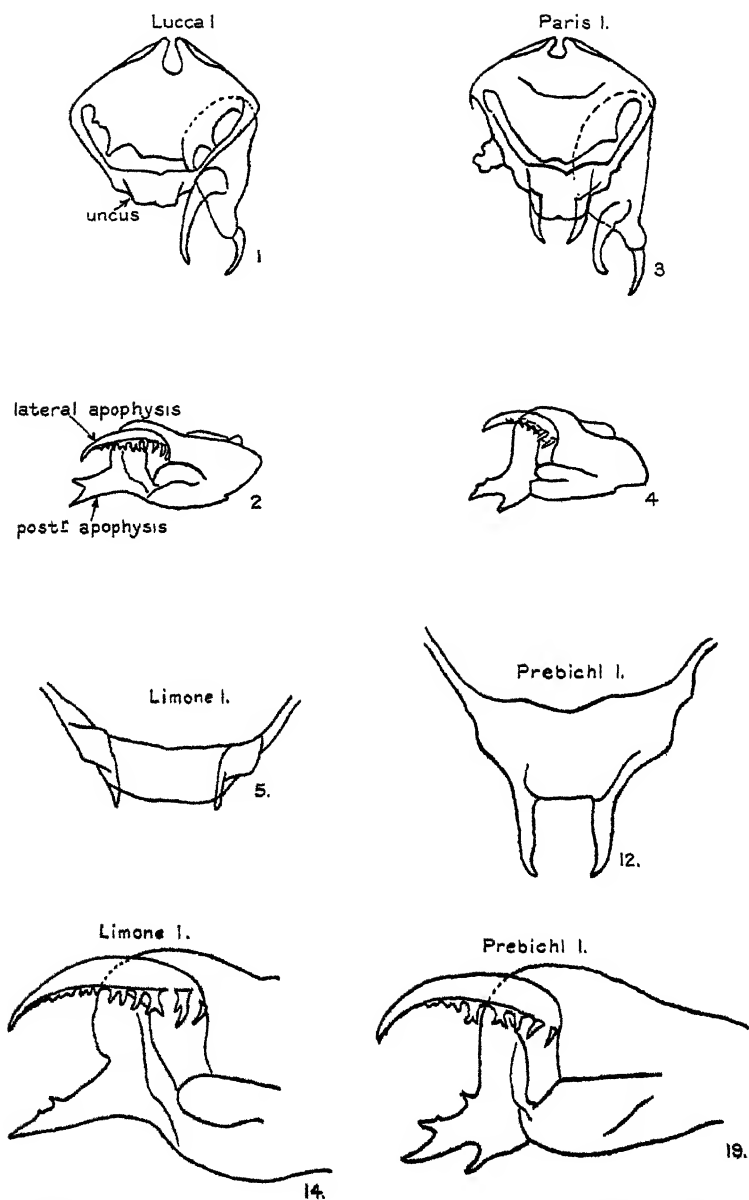
The London Naturalist for the year 1931.

Entomology does not bulk largely in the proceedings of the London Natural History Society, but there are notes by H. J. Burkill on Butterflies and Moths in 1931, and an introductory paper by the same author on Plant Galls, the interest in which appears to be very active in the Society. There is also included the substance of the Bacot Memorial Lecture on Studies on the Biology of Fleas, which was delivered by P. A. Buxton.

SOCIETIES.

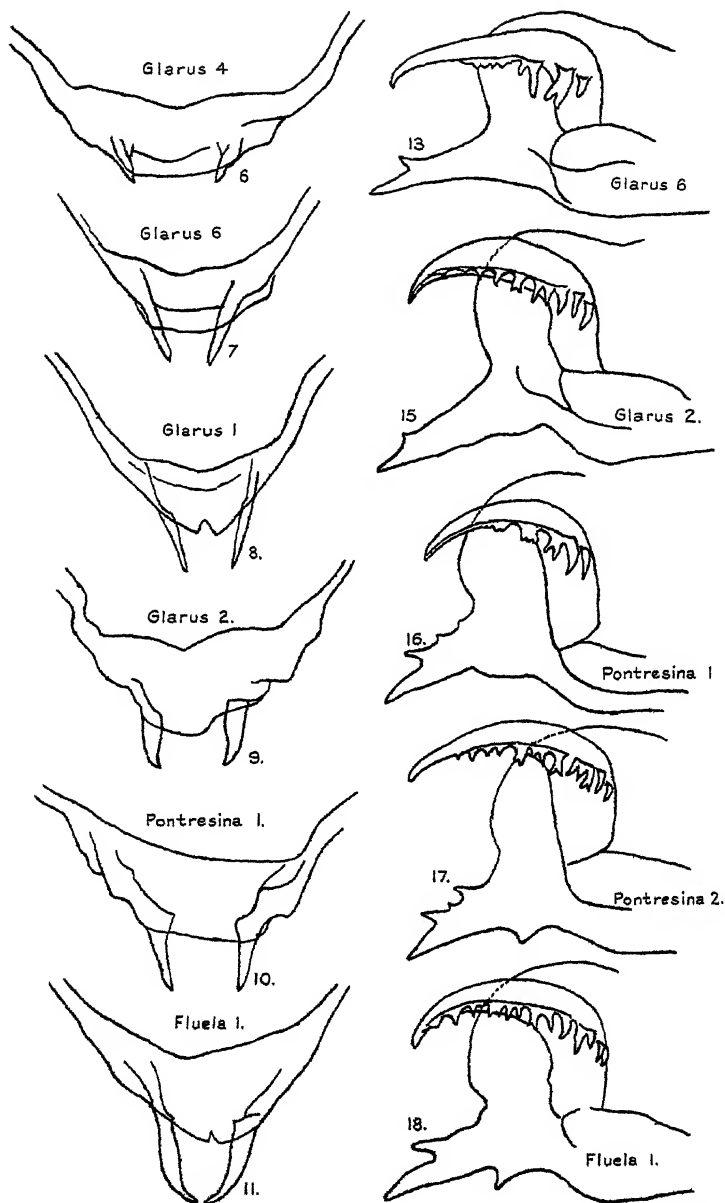
THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*July 14th, 1932.*
 —Mr. T. H. L. Grosvenor, F.E.S., President, in the Chair.—Mr. Niblett exhibited the cases made by *Phyllotoma aceris* in the leaves of the sycamore; Mr. Eagles, the larvae of *Coenoteaphria derivata*, from Hoddesden, Herts; Mr. Hawkins, larvae of *Nyssia zonaria* from the Llandudno district and of *Aspilates gilvaria*; The President, a yellow form of *Zygaena filipendulae*, bred from the third generation which produced all yellows; Dr. Cockayne, larvae of *Eupithecia pygmaea* from Cambridgeshire, both the brown and the green forms feeding on *Cerastium*. Reports of the occurrence of various species were made, *Cecura bifida* and *Pterostoma palpina* from Ashdown Forest, *Celias croceus* and *Hyloicus pinastri* from Aldeborough, *Dianthoecia carpophaga* common at Dungeness, the *artaceryes* form of *Plebeius medon* just emerging, the appearance of *Plusia gamma* and *Phryxus livornica*, *Coenonympha tiphon* and *Erebia epiphron* f. *cassiope* appearing about their usual date, *Limenitis sibilla*, *Melanargia galathea*, *Argynnis adippe*, *Dryas paphia*, *Thymelicus acteon*, etc., as fairly common. Mr. H. Niblett read a paper on Plant Galls, and placed numerous exhibits on the table in illustration.—HY. J. TURNER (*Hon. Editor of Proceedings*).

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at Speldhurst Close, Sevenoaks, on July 9th, 1932, Mr. H. Willoughby-Ellis in the Chair. Members present in addition to the Chairman: Mr. Robt. Adkin, Mr. Horace Donisthorpe, Mr. Jas. E. Collin. Visitors: Mr. J. H. Adkin, Maj. E. E. Austen, D.S.O., Mr. H. W. Andrews, Mr. E. C. Bedwell, Mr. F. W. Frohawk, Dr. K. Jordan, Mr. Hugh Main, Mr. J. F. Perkins, Mr. W. Rait-Smith, Capt. N. D. Riley, Mr. H. J. Turner. The members and visitors arrived at 3 o'clock and were received by Mr. and Mrs. Willoughby-Ellis. The Chairman's museum was open for inspection. It included his rearranged collection of British butterflies in 160 drawers, the British moths, British Hemiptera and British Coleoptera. Mr. Hugh Main, who was amongst the guests, brought a number of newly-hatched larvae of the Cetoniid beetle *Gnorimus nobilis* in their pabulum of decayed brown mould, from an oak tree, in which the eggs were laid. Tea was served on the lawns at 4 o'clock, after which, in brilliant weather, a tour was made of the gardens and woods. Supper was served at 6.30 p.m., and the party dispersed about 11 o'clock. Some of the guests remained at Speldhurst Close for the week-end, and on Sunday morning Darenth Wood was visited in very hot weather. The portions of the wood which still remain are very much overgrown, and considerable difficulty was experienced in proceeding from one part to another, and insects were found to be somewhat scarce. *Byctiscus betuleti* and many other species of Coleoptera were captured, amongst which was a very white variety of *Strangalia armata*.



L. & Huggins del.

John Hale sculp. & D. H. Huggins, U.S.N.M.



L. G. Higgins del.

J. H. Hale, Scars & Deane, sculpsit, London

MALE GENITALIA OF MELITAEA ATHALIA & M. PSEUDATHALIA.

THE ENTOMOLOGIST.

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[No 833

SOME OBSERVATIONS UPON *MELITAEA ATHALIA* ROTT.

BY L. G. HIGGINS.

(Plates V, VI.)

It is now twelve years since the late Prof. Reverdin (1, 2) noticed the difference that exists in this species in the male genitalia of specimens from northern and southern Europe. Reverdin defined these differences very carefully, and with some hesitation suggested that the two forms were specifically distinct. To the southern form he gave the name of *M. pseudathalia*. He was able to trace in some detail the main geographical distribution of the two forms, and he established the fact that while the areas inhabited by each approach very closely, there is nevertheless no overlap.

The principal differences in the genitalia of *athalia* and *pseudathalia* were defined by Reverdin as follows (Plate V, figs. 1-4) :

- (1) The uncus is well formed in *athalia*, absent in *pseudathalia*.
- (2) The posterior apophysis is short, wide and deeply notched in *athalia* ; long, slender and terminally bifid in *pseudathalia*.
- (3) The lateral apophysis is regularly curved in *athalia* with teeth on the proximal two-thirds : in *pseudathalia* it is longer, straighter, with teeth extending to the tip.

It is convenient to keep to Reverdin's nomenclature of the parts, though I think the so-called uncus is really formed by two sub-uncal projections. The lateral apophysis is more correctly termed the harpe.

While it is undoubtedly easy to place most specimens in one of the two groups by these characters, the genitalia show a wide range of minor variation, also noticed by Reverdin, which is quite unusual among Nymphalid butterflies. In *pseudathalia* the uncus may be completely absent, or represented by two small processes more or less developed (Plate V, figs. 1 and 5). The lateral apophysis may approach in shape and in the character of the teeth that found in *athalia*. The terminal apophysis may be longer or shorter, and the upper tooth is sometimes much reduced (Plate V, fig. 14). The forms of *athalia* are more constant, but also vary to some extent in the shape of the uncus and of both apophyses. It is probable that some of these characters may have a geographical significance, although in *pseudathalia* a series from any locality is likely to show quite definite variation. My specimens suggest that this instability is particularly noticeable as the northern limit of this form is approached,

but I have not been able to examine series from a sufficiently large number of localities to say whether this tendency is to be found everywhere. It is consequently rather difficult to define closely the typical genitalia of *pseudathalia*, and it is simplest to follow Reverdin, who calls everything *pseudathalia* which is not *athalia*.

In addition to these minor variations Reverdin reported anomalous intermediate forms principally from the Canton of Soleure, i. e. from the borderland between the distribution areas of the two main forms. This observation suggested that further investigation would be interesting, but material from the borderland area is very scarce in collections. Accordingly I went last year (1931) to several suitable localities and obtained a large number of specimens. These, on examination, showed an enormous preponderance of intermediate specimens similar to those reported by Reverdin from Soleure. The specimens can be adequately described by reference to the plates, where figs. 5 and 14 represent the enlarged uncus and clasp of a normal specimen of *pseudathalia* from the Maritime Alps, figs. 12 and 19 of normal *athalia* from Austria. The remaining figures show anomalous forms from various localities reported in the text below, and I think it will be of interest to tabulate the complete series as follows, where the numbers refer to the figure which best illustrates each specimen :

PONTRESINA, 8 specimens :

Uncus : 6, 7, 7, 9, 9, 9, 10.

Posterior apophysis : 14, 14, 15, 16, 16, 17, 17, 18.

Lateral apophysis : 14, 14, 14, 14, 16, 16, 16, 17.

GUARDA, 5 specimens :

Uncus : 10, 10, 11, 11, 11.

Posterior apophysis : 13, 13, 16, 16, 16.

Lateral apophysis : 13, 16, 16, 17, 17.

FLUELA PASS (above Sus), 7 specimens :

Uncus : 9, 9, 9, 10, 10, 11, 11.

Posterior apophysis : 14, 16, 17, 17, 18, 18, 18.

Lateral apophysis : 16, 16, 16, 16, 17, 18, 18.

GLARUS, 9 specimens :

Uncus : 6, 6, 7, 7, 8, 8, 9, 9, 9.

Posterior apophysis : 13, 14, 15, 15, 15, 15, 16, 16, 17.

Lateral apophysis : 13, 13, 13, 13, 15, 15, 15, 16.

ST. MORITZ, 2 specimens :

Uncus : 9, 11.

Posterior apophysis : 13, 16.

Lateral apophysis : 16, 17.

PILATUS, 1 specimen :

Uncus : 9.

Posterior apophysis : 17.

Lateral apophysis : 16.

ARGELES (PYRENEES), 9 specimens :

Uncus : 6, 6, 6, ?, 7, 7, 10, 11, ?.

Posterior apophysis : 13, 14, 14, 14, 14, 15, 15, 15, 16.

Lateral apophysis : 13, 14, 14, 14, 14, 14, 14, 15, 16.

While, naturally, it is impossible to describe each specimen with absolute accuracy by reference to a limited number of figures, the analysis given above is sufficient for practical purposes. It is at once obvious that in each series there is a very definite suggestion of the mutual approach or fusion of the two forms. The intermediate character is of every degree, though this varies in different localities. For instance, at Glarus and Argeles the specimens are on the whole nearer to *pseudathalia*, at Pontresina almost exactly intermediate, and at Guarda and the Fluela much nearer to *athalia*. This difference can be explained by assuming a gradual modification in proceeding from south to north across the boundary line—evidence of which I have previously mentioned. By a comparison of these observations with those of Reverdin it seems probable, however, that the actual transition from obvious though modified *pseudathalia* to recognizable *athalia* occurs somewhat abruptly, and that the borderland area is not more than 30 to 50 miles in width, perhaps even less.

These intermediate specimens, showing every possible gradation between *pseudathalia* and *athalia*, and also those reported from Soleure by Reverdin, are all from the zone where the known areas of distribution of the two forms come into apposition. They have been found in every case where this boundary zone has been investigated, and it is not unreasonable to suppose, though not yet

EXPLANATION OF PLATES.

PLATE V.

FIG. 1.—*M. pseudathalia*, ♂ genitalia viewed from above, left clasp removed.

FIG. 2.—Ditto, left clasp viewed from within.

FIG. 5.—Ditto, "uncus" enlarged.

FIG. 14.—Ditto, clasp enlarged.

FIG. 3.—*M. athalia*, ♂ genitalia viewed from above, left clasp removed.

FIG. 4.—Ditto, left clasp viewed from within.

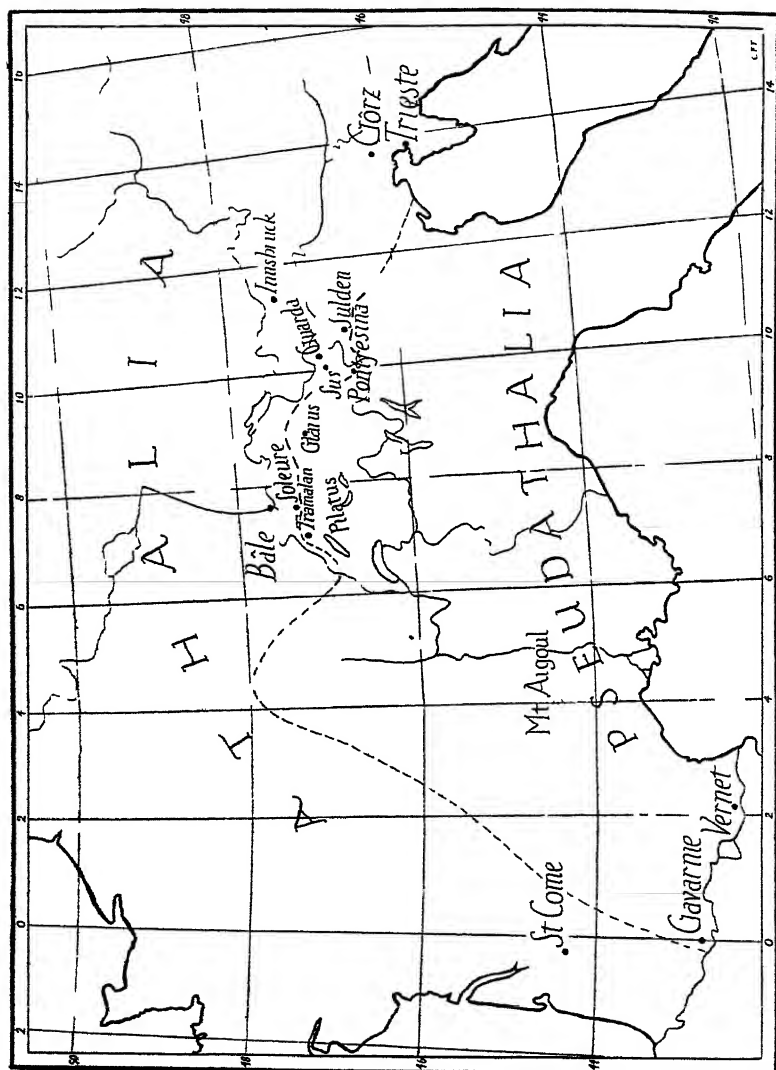
FIG. 12.—Ditto, uncus enlarged.

FIG. 19.—Ditto, clasp enlarged.

PLATE VI.

FIGS. 6-11.—Uncus enlarged, showing various forms reported in text.

FIGS. 13, 15-18.—Clasp enlarged, showing various forms reported in text.



proved, that similar intermediate forms will be found in other localities situated in this borderland area. At present such forms have not been reported from anywhere outside this district. Reverdin found none in his researches, which included 765 specimens, to which I can add about 150. A much larger number might have been examined, but except in the borderland the results are so monotonously uniform that further investigation of this point seems superfluous.

The consideration of these facts suggests very strongly that *pseudathalia* does not stand in that relation to *athalia* which is usual between forms held to be specifically distinct. This view is strengthened by the very significant observation that the distribution areas nowhere overlap. The facts suggest rather that we are dealing with two forms whose relation is subspecific in the ordinary biological sense; that *athalia* and *pseudathalia* are geographical races which cannot maintain their identity, but fuse when brought into apposition: and that the difference in the genitalia has no greater significance than a difference in size, wing-marking or shape showing similar geographical and biological characters. It is often assumed that a difference in genitalia is a specific difference *ipso facto*. It has long been known that this is not so (3), and it is well to recall that it is not at present possible to go further than the statement that in different species the genitalia usually differ. We must consider the genitalia as part of the species and not *vice versa*.

In this connection it is interesting to note that the remarkable variability of the genitalia in *M. athalia* has received further attention. Hormuzaki (4) has described as *athalia* var. *aceras* a form from Rumania in which the posterior apophysis is much reduced or even quite absent, while the lateral apophysis recalls *pseudathalia*, as is often the case in specimens from south-eastern Europe. The exact significance of this form is uncertain, but it appears to occur in only a few localities, and is not considered by Hormuzaki as distinct specifically from *athalia*.

Turning now to the distribution areas of *M. athalia* and *pseudathalia*, it is very interesting to notice the very close approximation to those of other butterfly species. In the accompanying map this distribution is indicated as accurately as possible from the data given by Reverdin, supplemented by my own observations. Unfortunately very little is known of the position in France. Reverdin records a single intermediate specimen from St. Comé, Gironde, and I have found *athalia* characters appearing in the Pyrenees. Otherwise we only know broadly that *athalia* flies in the north and west, while *pseudathalia* occurs in the south and south-east.

I have a few specimens which suggest that in western Switzerland the transition commences somewhere between the lakes of Geneva and Neuchâtel. There is an almost exact parallel in the distribution of *Erebia euryale euryale* Esp. and *E. e. adyte* Hb. (5); marked similarity in *Hesperia malvae* L. and *malvoides* Elw. & Ed. and others.

The southern limit of the range of *M. athalia* recalls the distribution of several typically Germanic insects, such as *Coenonympha oedipus* F., *Argynnis aphirape* Hb., *Pararge achine* Sc. Many other examples might be given, but in so many cases there is an element of doubt as to the precise geographical distribution of even the commoner insects, and comparison must be made with caution. There is a very suggestive similarity to be found in other classes of animals (6): for example, in fishes in the fresh-water perches, and in the Common Grouse, which correspond with *athalia*, while the distribution of Phasmids recalls that of *pseudathalia*.

A distribution limit so frequently found can scarcely be the result of chance, and calls for explanation. While this is perhaps not yet possible, there are two noteworthy facts which are obvious from a consideration of the known distribution of *M. athalia*.

In the first place temperature and probably climate can scarcely be responsible. Both forms are found at all elevations from sea-level to the Alpine or at any rate to the highest sub-Alpine zone. The limiting boundary does not correspond with any isotherm, but, on the contrary, crosses the main Alpine chain from east to west. Local races occur which show differences in size and markings, which may be due with some probability wholly or in part to differences of temperature, moisture, food-plant and other biological conditions. A large number of such local forms have been described, forming a heterogeneous assembly, showing in their distribution little or no relation among themselves, or with the distribution of the two main races *athalia* and *pseudathalia*.

In the second place most, if not all, of the butterflies whose distribution resembles that of *athalia* (as distinct from *pseudathalia*) are widely spread in Asiatic Russia. *E. euryale* extends to the Altai; *C. oedippus*, *A. aphirape* and *P. achine* are probably to be found right across Siberia. The most characteristic feature of our northern *athalia* is the well-formed uncus. I have been able to examine the genitalia of several North Asiatic forms of *athalia*, and these all resemble the German form in this respect, though definite minor differences suggest the existence of at least two Asiatic races. It is therefore probable that *M. athalia* in Northern Europe is a member of the Northern Asiatic butterfly fauna, and presumably it arrived in Europe with the other members of this group. We may speculate on the immigration of *pseudathalia*

by another route from the same ancestral stock. But what of the mysterious influence which maintains the equilibrium between *athalia* and *pseudathalia*? There is no reason to suppose this distribution is changing; in the parallel case of *E. euryale* at least there has been no modification of importance since the days of Esper. So far as I am aware there is no clue to suggest an answer to the riddle, but records of racial distribution are scanty and are badly needed. I therefore venture to hope that these somewhat fragmentary observations may be sufficiently definite to merit attention.

BIBLIOGRAPHY.

1. *Bull. Soc. Ent. Fr.*, 1920, p. 320.
2. *Bull. Soc. Lep. Gen.* 1922, 5, p. 24.
3. ROTHSCHILD AND JORDAN.—*Rev. of Sphingidae*, particularly the introduction.
4. *Zeit. wiss. Insectenbiologie*, 1911, 7, p. 214.
5. HIGGINS.—*Entomologist*, 1928, p. 125.
6. BARTHOLOMEW.—*Atlas of Zoogeography*, 5.

VANESSA ANTIOPA IN WEST SUSSEX.—While I was camping at Bognor Regis in early August, a large specimen of *Vanessa antiopa* flew in. I was unable to take it, as I had no apparatus, but it settled on the canvas and made its identity obvious. Is this the result of an attempt to set the species up in England, or was it a true visitor? On August 19th I took *Limenitis sibylla* in the garden here at Leatherhead, on Buddleia. Also at Buddleia the previous day I took *Polygonia c-album* at Godalming. I took only one specimen of *Colias croceus* at Bognor Regis, and saw another on the South Downs.—A. W. COLLETT; Bridleway, Tyrrells Wood, Leatherhead.

RHODEMETRA SACRARIA AT EASTBOURNE.—In view of the sporadic occurrence of the moth *Rhometra* (*Sterha*) *sacraria* (Linn.) in Britain, it may be well to place on record the capture of a ♂ of this species by myself on Saturday, August 13th. It was taken on the stretch of shingle between Eastbourne and Pevensey known as "The Crumbles," and was in fairly good condition.—A. L. RAYWARD; 15, Vicarage Drive, Eastbourne.

VANESSA ANTIOPA IN KENT.—On August 13th, while walking on the Shirley Hills, I was fortunate enough to observe a perfect specimen of the Camberwell Beauty. It alighted on a pebble at my feet and I was able to admire its beauty before it flew off.—B. POTTER; 7, Burnhill Road, Beckenham, Kent.

POLYGONIA C-ALBUM IN SURREY.—With reference to the Editor's remarks on p. 200 (*antea*), I am able to report the capture of one *P. c-album* near Witley on August 10th last, making the fourth season in succession in which the species has occurred in that district.—A. A. W. BUCKSTONE; 42, Pams Way, Ewell, Surrey.

ZYGAENA ACHILLEAE IN ARGYLLSHIRE.

BY RUSSELL JAMES, F.E.S.

FOR many years since reading Mr. Reid's account of his capture of *Anthrocera achilleae* (*Entom.*, 52: 188) it has been my ambition to follow up this species.

My son and I were staying at Garelochhead in Dumbartonshire from June 14th to 18th, but this was so far from the base Mr. Reid mentions, and the date some ten days earlier than his captures, that we had not seriously considered trying this year. We worked Rannoch by car for the first two days, but found our calculations all at fault for the species we expected. Judging by the late season in the south, we had expected to find *Anarta melanopa* and *A. cordigera* still in condition. Instead of this, the season in Scotland was very forward, and although we took a few worn *A. melanopa*, *A. cordigera* was quite finished.

This being so, we weighed up the situation—our empty bag, the gorgeous weather, the early Scottish season—and we decided for our last day to make a 3 a.m. start, and at any rate explore the country that we believed to be Reid's and Esson's ground. I had a valuable hint given to me, in confidence, as to the probable centre of their efforts, and this Argyllshire village was made our objective. A word of warning here to anyone working Western Scotland by car. Do not look at maps and assume that car ferries are always at your disposal. Also fill your tank right up at every opportunity. Pumps we found to be few and far between, and then most of them were empty.

Working from our village—which we found to consist of two or three cottages and a scattered farm or two—we eventually ran our quarry to earth about 6 p.m., and some twelve miles from our starting-point, but alas! the early season was too early, and only one good and three rather worn specimens could we find among a host of *Zygaena filipendulae*.

I think Mr. Reid's statement that *achilleae* is the common Burnet of the district and outnumbers *filipendulae* by 10 to 1 requires much modification. It is true that he suggests that he found *achilleae* over a considerable area, but from local inquiries made I am pretty sure the spot we found was his principal ground.

From the relative condition of the two species *achilleae* is evidently the earlier, and although they overlap, I doubt whether they are ever in full flight together. Confirming this view, Mr. W. G. Sheldon tells me that at the time he took the original British example of *achilleae* by Loch Etive thirty or so years ago—so worn

as to be scarcely recognizable—*filipendulae* was only freshly out near Oban in a much warmer locality. I should imagine, therefore, that when Mr. Reid was taking *achilleae* in good condition, few *filipendulae* were out. I cannot imagine that he found *achilleae* in anything like the numbers that we found *filipendulae*, or he could have supplied most of the cabinets in Britain.

Zygaena achilleae can be distinguished at once by its hairier body, yellow legs and much duller colouring—the one really fresh specimen being totally different in this respect. The elongation of the basal spots also is quite distinctive, but the union of the apical spots into a kidney-shaped blotch is by no means a definite character, as we found a large percentage of the *filipendulae* here had this tendency—one or two quite as marked as in *achilleae*. In fact the *filipendulae* are an interesting race. I should imagine that the species are not closely enough allied to inter-breed, but the fact remains there is a strong tendency to vary towards *achilleae*. The average size is small; the red spots appear to be rather thinly scaled and inclining to a pinkish colour. In nearly all the apical spots are very large—so large that in the great majority of cases they either touch or coalesce in a greater or less degree.

I have found this tendency to be exceedingly rare in *filipendulae* elsewhere, and it is strange, therefore, that it should be so marked in a race that flies with *achilleae*, where this feature is a definite specific character. On the other hand, there is no tendency towards lengthening of the basal spots in the *filipendulae*.

In the course of our long journey we took a freshly emerged *Emmelesia blandrata* on a post by a bridge. On our return late in the evening we took four more (besides missing half-a-dozen), down by the bed of the stream at rest on the bridge, or on alder-stems. In the neighbouring meadows *E. albulata* was flying in the evening sun in vast myriads, but I could find no *blandrata* among them, although the latter's haunts by the stream were invaded by a few *albulata*.

A long and most interesting day finished by a loose stone on the road puncturing our tank just about midnight. Luckily the last drops of petrol ran out close to an isolated hotel, where we could get a supply in tins. We could do nothing with the tank, but an hour's work cutting and freeing the petrol feed pipe enabled us to run it into a two-gallon tin as a tank. This and a further spare tinful took us back to Garelochhead by about 3.45 a.m., having had a twenty-four and a half hour day and covering 251 miles by the speedometer. Those who get *achilleae* deserve it, but we hope at the earliest opportunity to use the information we have acquired to become better acquainted with the species.

Having non-entomological members of the family with us, we

did little collecting at Garelochhead. Beyond taking some beautiful *Acronycta menyanthidis* from telegraph posts, and a good series of *Melanippe tristata* which flew in numbers in Glen Croe, near Arrochar, in the early afternoon sun, we made practically no captures. We returned home, however, well satisfied at having located such an elusive insect as *Zygaena achilleae*.

Dial House,
Ongar Park,
Essex.

COLIAS CROCEUS IN THE UPPER THAMES VALLEY.—From August 6th to 20th I spent with my friend a holiday on the Thames above Oxford. On three occasions we saw *C. croceus*, one specimen, a male, being taken at Northmoor Lock (Berkshire bank). Another was observed at Shifford Lock (Oxford bank), and a third at Rushey Lock (Berkshire bank). I believe nearly all records last year (see the *Entomologist*, June, 1932) were from localities on or near the coast, as is again the case this year. It should, however, be noted that as the river is the county boundary, these inland records are really fictitious as far as the counties are concerned, as the insects could fly freely from one bank to the other.—A. H. STRINGER; 19, Exeter Road, Croydon, Surrey.

FEEDING HABITS OF AGRIADES CORYDON.—On August 10th, while on the South Downs, I noticed about a dozen *A. corydon* ♂♂ sitting on a large flint. On examining the stone I found that it had been used by thrushes to crack snails on, and it was still moist with snail juice.

Colias croceus has been fairly abundant on the South Downs, and on August 20th I saw a male here at Balcombe.

Polygonia c-album has visited Buddleia blossom here at Balcombe.—H. M. EDELSTEN; Bramble Hill, Balcombe.

ACHERONTIA ATROPOS AND COLIAS CROCEUS IN DORSET.—I beg to report the capture of three larvae of *Acherontia atropos* this month near Bridport, also of one fine imago on May 28th, on a wall in Bridport. I have also seen a number of *Colias croceus* near Burton Bradstock.—C. B. HOLMAN-HUNT; The Laurels, Walditch, near Bridport, Dorset.

CARADRINA EXIGUA IN SUSSEX.—I captured a specimen of *Caradrina exigua* at sugar on August 27th at Fulking, about eight miles north-west of Brighton.—F. H. LYON; 22, Murray Road, Northwood, Middlesex.

SPHINX CONVULVULI AT READING.—A live imago of *Sphinx convulvuli*, ♂, was brought me to-day. It had been taken this morning by Miss Jeffery, in the garden of Mrs. Benton at 60, Conisboro' Avenue, Caversham Heights.—C. H. LONG; "Ringwood," 9, Morecambe Avenue, Caversham, Reading, September 21st, 1932.

SOME OBSERVATIONS ON *AGRIADES BELLARGUS*.

BY J. A. SIMES, F.E.S.

As recorded in an earlier paper (*antea*, p. 84), a short visit to the Dept. of Charente, France, in June, 1931, last for the purpose of obtaining the beautiful blue ♀ f. *coelestis*, Obth., of this species proved successful. *A. bellargus* was abundant everywhere on the limestone, but the great majority of the females were of the brown form with but slight traces of blue. The bright blue female of which we were in search was, however, of fairly frequent occurrence, but the fact that it is of scarcely less brilliant coloration than the male made it difficult at first to identify it in the field. Careful observation of the two sexes on the wing eventually enabled us to overcome this difficulty, and it occurs to me that a few hints on the subject may be of use to others who may work for f. *coelestis* in the future. The considerations involved may be briefly summarized under three heads :

(1) The males of *bellargus*, in their quest for mates, keep up a protracted fluttering low down over the herbage. They rarely alight, and when they do it is as a rule only after a lot of fussy hesitation and doubt whether they shall settle on one blossom or on another close by. The females, on the other hand, are far more decided in their habits. The flight is short and purposeful. They go from one flower straight to another, and alight abruptly and without hesitation ; and they are even more decided in their actions when they are ovipositing. This difference in habits does a great deal to enable one to pick out the blue female from the males.

(2) The males, in order to find their mates, reconnoitre every butterfly, whatever its size or colour, that chances to pass anywhere near. If the other insect is anything but its own female the interest generally evaporates at once ; but if it is a female of the same species a sustained flirtation ensues. It follows that if you see two blue butterflies thus meet and the interest is maintained, one of them is pretty sure to be a female.

(3) Finally it was noted that on the wing *coelestis*, especially when fresh, gave the impression of a distinct red strain combining with its blue pigment, the result, no doubt, of the red ocelli on the upperside.

A few notes which I made on the courtship habits in *A. bellargus* may be of sufficient interest to record. I observed that several couples on meeting, while buzzing round one another in the well-known fashion, mounted steadily in the air until they were 60 or

70 ft. up. This carried them into the danger-zone, where swifts and swallows were hawking; but I saw no casualties. the birds taking no notice of the butterflies. The habit of flying up into the air during courtship is, of course, frequent in other species of butterfly, notably in *Papilio podalirius* and *Pieris rapae*. After a time the *bellargus* couples gradually descended, the female reaching the ground first and alighting on a flower, where the male joined her. In two instances copulation was effected within thirty seconds of alighting, and the male was able to carry his partner away when they were disturbed. Paired couples netted in the field were observed to separate very quickly, often before they could be boxed.

I watched a few females ovipositing in the field, including one *coelestis*. In each instance the egg was laid on the upperside of a leaflet of the food-plant near to the ground.

Several females, including one or two *coelestis*, were brought back to England alive, and from them I obtained a number of eggs, which for the most part were deposited on the gauze of the cage. A few were laid on the growing food-plant and a few on the flower-pots in which the plants were contained. The butterflies began to die off two or three days after arrival, the last dying on the eighth day. The eggs began to hatch in about sixteen days. I rarely saw the larvae in their earliest stages; but the leaflets of the food-plant developed white spots in ever-increasing number as the tiny larvae ate off the cuticle from both upper- and underside. Eventually the leaflets became entirely white. As the larvae grew, however, they began to feed in the normal way, eating the entire substance of the leaf from the edge inwards, and when the leaflets were all finished they devoured the softer parts of the stem. They fed almost entirely by night or in the early morning, and the slightest vibration of the plant was sufficient to make them fall to the ground. In the daytime they hid away at the root of the plant, the favourite position being back downwards, on the lowest stems and often in actual contact with the soil. Now and again one or two would go just below the surface. They fed up much more slowly than they should have done owing to the cold weather in July and August. They resolutely refused to eat anything but *Hippocrepis comosa*, although in periods of temporary shortage of this food I tried them with *Lotus corniculatus*, *Vicia* and other *Leguminosae*. A small black ant in my greenhouse discovered the larvae and soon found out all about the properties of their dorsal glands, and attended them regularly thereafter in the well-known manner. This was very interesting, because the ants could have had no previous experience of the myrmecophilous Lycaenid larvae—certainly not of the larvae of *Agriades bellargus*.

Owing to my unavoidable absence from home for a week in

August the larvae had to be left to their own devices, and I lost a large number in consequence. At the beginning of September the survivors retired to out-of-the-way corners and spun a few strands of silk round themselves, and gradually relapsed into the comatose condition which precedes pupation. They remained in this condition for some eight or nine days before pupation. The first emergences took place at the beginning of October. All the butterflies are of the ordinary Charentoise form, and no *coelestis* has appeared.

COLIAS CROCEUS AND IMMIGRANTS IN DORSET AND DEVON.—On June 13th last *Colias croceus* was flying across the Langmoor Gardens at Lyme Regis about midday. Apparently the insect was a newly emerged male. The wind was easterly and fresh. The following day another was seen at the base of the cliffs just over the county border in Devonshire. This was captured and released. It was a perfect male, with the exception of a small fracture in one wing, probably caused by the grass under the net. Later in the day what looked like a female was seen flying about a mile inland. From June 9th to 16th *Pyrameis atalanta* and *P. cardui* were very common, the former in surprisingly good condition. Both species seemed to frequent high exposed positions, such as Golden Cap, and did not mind a strong wind. *Vanessa io* was also seen, but was far less common.—G. HANSON SALE; Coxbench, Derby.

APHOMIA GULARIS (ZELLER) IN LONDON.—A specimen of this introduced species was taken by myself in Moor Lane Finsbury, E.C., on July 15th. It was a male, and apparently freshly emerged—no doubt from a nearby importer's warehouse. There are specimens of this insect in the British Museum labelled Bournville, but China, Japan, etc., are apparently its native clime. Perhaps some reader could state whether this species has been known to breed in England, or whether it is only imported in the pupa or imago state.—S. WAKELY; 8, Woodland Hill, Upper Norwood, S.E. 19.

LIMENITIS SYBILLA VAR. NIGRINA IN THE NEW FOREST.—On July 23rd in a ride in the neighbourhood of Lyndhurst I had the good fortune to take, settled on bramble, two male specimens of this uncommon variety of the White Admiral. One was slightly chipped, but the other was in very good condition. In each case there was a slight trace of the white markings on the upper surface, but the underside was characteristically different from the normal insect.—C. G. M. DE WORMS; Egham, September, 1932.

MADOPA SALICALIS IN KENT.—On June 12th, a very sunny day, I caught, in a wood in mid-Kent, a small unfamiliar moth flying during the afternoon. I was surprised to find it was a fresh female of this scarce Deltoid moth which, I gather, has not been recorded for some time. I tried to get ova from it, but in vain.—C. G. M. DE WORMS; Egham, September, 1932.

MOTH-TRAP RESULTS, 1931.

BY C. G. M. DE WORMS, F.E.S.

As in 1929 and 1930, the moth-trap was in use throughout 1931, being situated, as before, on the verandah and illuminated by the 200 candle-power bulb. Complete records of weather conditions and the maxima and minima of temperature during the periods of operation were kept, and it was generally to be found that those nights were best when the temperature began to rise gradually after darkness had set in, no matter what the direction of the wind.

The light was started on February 9th, a very mild evening attracting a good many *Phigalia pedaria*. It was tried intermittently but without much success until the end of the month, when a very cold spell set in and operations were not resumed till March 12th. Apart from a good many of the early species, results on 17 nights between this date and April 8th were very disappointing.

On returning from abroad the trap was again used on April 27th, and from this date onwards till the end of May visitors were much more numerous. On May 6th and 8th I took 4 specimens of a *Taeniocampa*, subsequently expertly identified as *T. opima*, a species of uncommon occurrence in the south. *Pheosia dictaeoides* and *Pygaera curtula* were taken on May 17th and 24th respectively, but the "Prominent" family was not so plentiful as in 1930. The best night of the month was the 27th, when there was quite an influx of moths following a heavy thunderstorm.

June headed the lists as regards numbers, 233 individuals being recorded on 29 nights. Of the 45 species the only two of note were *Lithosiu mesomella* and *Scodiona fagaria*, both associated with heathland, the nearest being two miles away.

Though the weather was for the most part favourable during July, results were disappointing and numbers below the average. August, however, proved a much better period for the time of year. The first few days provided the warmest nights of the year, the minimum night temperature on August 4th being 63° F. Of the 54 species recorded, *Pheosia tremula* (second brood) was taken during the middle of the month. A late *Mitochrista miniata* appeared on August 13th, and on the 3rd *Leucania turca*, a species not often met with at light.

The autumn months were fairly good for light, at any rate better than for sugar or ivy, both September and October providing most of the commoner species, including six of the Thorns. By far the most numerous was *Amathes lunosa*. There were also some quite good nights for the late autumn species during November and early December.

The trap was tried on 213 nights between February 9th and December 15th. The grand total was exactly 1000 individuals (935 males and 65 females)—slightly less than in 1930. This figure comprised 234 Bombyces, 289 Noctuae, 455 Geometrae and 22 Hepialidae.

The total number of species represented was 160 (13 more than for 1930), made up of 24 Bombyces, 58 Noctuae, 75 Geometrae and 3 Hepialidae.

Spilosoma menthastris once more headed the list for numbers with 85 specimens: the second place went to *Amathes lunosa* with 66. *Euchloris pustulata* was again numerous at the end of June, while *Ennomos erosaria*, as before, lasted over a very long period—from July 25th to October 17th.

There was, however, no outstanding night during the season.

The following 23 species had not been previously recorded for the trap. Those marked with an asterisk had not been noted before in the locality:

BOMBYCES.—**Lymantria monacha*, August 13th; **Gastropacha quercifolia*, July 24th.

NOCTUAE.—**Bryophila perla*, August 5th; *Cerigo matura*, July 31st; **Ochrea ochracea*, September 30th; **Coenobia rufa*, July 15th; *Leucania turca*, August 3rd; **Taeniocampa opima*, May 6th to 9th; *Calymnia diffinis*, August 4th; *Amathes litura*, October 8th; *Scoliopteryx libratix*, May 12th; *Plusia gamma*, September 19th; **Zanclognatha grisealis*, July 3rd.

GEOMETRAE.—**Adaria corylata*, June 13th; **Perizoma flavofasciata*, May 30th; **Eupithaecia castigata*, June 21st and July 9th; **E. subfulcata*, July 18th to August 18th; **E. exigua*, June 8th; **E. nanata*, August 18th; **Pelurga comitata*, August 4th; **Ennomos quercinaria*, September 9th; **Epione apiciaria*, August 15th; **Scodiona fagaria*, June 16th.

Milton Park,
Egham;
March, 1932.

LEUCANIA ALBIPUNCTA IN KENT.—On August 20th, in the Romney Marsh area, I casually took a moth flying just after dusk. To my astonishment it turned out to be quite a fresh specimen of this rare Wainscot, which I am told has not been recorded in Kent for a considerable time. Another specimen was taken shortly afterwards.—C. G. M. DE WORMS; Egham, September, 1932.

MANDUCA ATROPOS AT EGHAM, SURREY.—On September 15th there was brought to me a pupa of the Death's Head Hawk Moth dug up on an allotment of potatoes near Runnymede. It was alive and undamaged. I am at present subjecting it to warmth with a view to forcing the emergence of the moth before the winter.—C. G. M. DE WORMS; Egham, September 17th, 1932.

GALL-CAUSING CYNIPIDAE IN BRITAIN.

PART II.

BY M. NIBLETT, J. ROSS, AND H. J. BURKILL, M.A., F.R.G.S.

(Continued from p. 197.)

IN this part we list those galls which we know to have been found on various species of oak in this country. Only brief references are made to the question of alternating generations, upon which there is much work to be done by anyone who cares to attempt to fill in the blanks. There is also a great deal of information required as to the distribution and occurrence of the galls themselves, their causers, inquiline and parasites.

The majority of the species have been observed by members of the London Natural History Society in the Home Counties, or in the case of Dr. R. S. Bagnall in Northumberland and Durham, where he has worked in co-operation with Prof. Heslop Harrison in adding many fresh records to the British list. The Yorkshire ones are the work of H. J. Burkill.

In the neighbourhood of London the species of oak chiefly met with is *Quercus robur* Linn. (= *pedunculata* Ehrh.). *Q. sessiliflora* Salisb. is not so often seen, but at Limpsfield Chert and Friday Street there are areas covered by young trees of this species. It is plentiful in Shropshire and parts of Yorkshire, and in the west, where it has been examined in Somerset (J. Ross). *Q. cerris* Linn. is to be seen in many places, but though it is well galled on the Continent by many species of Cynipidae, which also occur here, very few of them seem to attack the Turkey oak in Britain, but confine their attentions to the typical British species, *robur* and *sessiliflora*.

1. *Cynips kollari* Htg. The Marble gall. Common on *Q. robur* and *Q. sessiliflora*. We have one record on *Q. cerris* from near Leatherhead.

2. *C. corruptrix* Schl. Small galls in the young woody twigs causing a mammillated appearance. Possibly widespread, but overlooked. First record for Britain seems to be that of Bagnall and Harrison (*Vasculum*, July, 1919). We have seen it also in Bucks, Kent, Middlesex, Surrey and Yorks. On *Q. robur* and *Q. sessiliflora*.

3. *Biorrhiza pallida* Oliv. The Oak-Apple gall. A sexual generation form. Usually common, but in 1931 was very scarce round London, though plentiful again this year. On *Q. robur* and *Q. sessiliflora*.

Cameron, in *British Phytophagous Hymenoptera*, 4: 119, states that the female not infrequently has the wings rudimentary or entirely obsolete. Dr. Adler, in *Alternating Generations*, p. 74, says, "The females are wingless or with rudimentary wings only." Swanton, in *British Plant Galls*, p. 35, says the same. Our experience is that the wingless female is rare. Until this year one of us (H. J. B.), who has bred the flies for some seasons, has never had a wingless fly. This year one gall has produced 21 males, 28 winged and 2 wingless females. Another (M. N.), also in several years' breeding, has not yet seen a wingless female. If all the females were wingless the galls could not be produced on trees more than a few yards away from the parent tree, as the fly could not travel any distance, whereas, as it is, it is generally well distributed.

4. *B. aptera* Fabr. The agamic generation of the last-named. It is wingless, and the galls occur on the roots below the surface of the ground, so though well distributed, it is not often found in the fresh condition. On *Q. robur* and *Q. sessiliflora*.

5. *Trigonaspis megaptera* Panzer. Sexual generation. On buds on the boles of old oaks, on young shoots from old stumps, or on the main stems of saplings. In the spring. On *Q. robur*.

6. *T. renum* Giraud. The agamic generation of the last. Occurs on the veins on the under-surface of leaves, generally in dark shade. September. On *Q. robur*.

7. *T. megapteropsis* Wriese. Sexual generation. Added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919). The insect resembles *T. megaptera* and the galls are similar, but the agamic generation is the next one, *T. synaspis*.

8. *T. synaspis* Htg. Added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919). The gall is fleshy, like that of *Diplolepis quercus-folii*, but smaller, always shining, green at first, then red with yellow spots. It matures in June and drops from the leaf. The insect emerges in July of the same year. So far only recorded in Britain from Durham.

9. *Diplolepis (Spathegaster) taschenbergi* Schl. Sexual generation. A small hairy bud gall, red to purple in colour, on the trunk or branch in April and May. It is not easy to see, and is more often detected after the insect has emerged, as the exit hole attracts attention. Generally distributed. On *Q. robur* and *Q. sessiliflora*.

10. *Diplolepis (Dryophanta) quercus-folii* Linn. The Cherry gall. The agamous generation of the last. Some years fairly plentiful on the under-surface of the leaves of *Q. robur* and *Q. sessiliflora*.

11. *D. similis* Adler. Sexual generation. A small hairy bud gall covered with greenish grey hairs. Low down on the trunks of old trees in April. Not easy to see. On *Q. robur* and *Q. sessiliflora*.

12. *D. longiventris* Htg. The Striped Cherry gall. The agamous generation of the last. Found on the under-surface of the leaf. Seems to be generally distributed, but never in profusion. On *Q. robur* and *Q. sessiliflora*.

13. *D. verrucosa* Schl. The Red Wart gall. Sexual generation. A brown or reddish papilla on the leaf or bud in the spring. Matures quickly and is not often noticed. On *Q. robur* and *Q. sessiliflora*.

14. *D. divisa* Htg. The Buckshot gall. The agamous generation of the above. A roughly spherical hard gall on the veins on the under-surface of the leaf. June to September. Sometimes very abundant. The fly emerges in the autumn of the same year, and at once proceeds to oviposit in the buds for next spring. On *Q. robur* and *Q. sessiliflora*.

15. *D. agama* Htg. Agamous generation. Roughly spherical in shape, tending to be flattened on the top. Whitish yellow, becoming brownish. On the under-surface of the leaf. Only a few galls seem to be developed on any one bush, and it is not plentiful as a rule. It was, however, found abundantly on some scrub oak on a hillside in Staffordshire in 1914, but next year all the undergrowth was cleared away on this spot, and the gall disappeared (H. J. B.) On *Q. robur*.

16. *D. disticha* Htg. Agamous generation. Somewhat similar to the last, but with a roughly flattened top as if a part had been cut off. It contains two cavities, the distal one of which is empty. It occurs on the under-surface of the leaf. Usually only in scattered numbers on *Q. robur*. More plentiful on *Q. sessiliflora* (M. N.). Also seen frequently on the latter this year in Somerset (J. R.). Noticed in Cornwall (*London Naturalist*, 1922).

17. *D. flosculi* Giraud. The sexual generation of the next species. Added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919). A bud gall 2.5 mm. long, covered with red hairs. The fly appears in May of the same year. So far only recorded as far as we know for Durham and Northumberland over here. Houard records it as on *Q. pubescens* Willd. for Central Europe, France and Italy.

18. *D. pubescentis* Mayr. Agamous generation. Also added to the British list with the last-named. A spherical light brown gall on the under-surface of the leaf.

19. *Andricus trilineatus* Htg. Sexual generation. Small swellings on the twigs where the elevation of the bark indicates a white oval gall underneath. In some cases a number are found close together in a green shoot, which then has a mammillated appearance. Also causes swellings on the leaf petiole and mid-rib. Fairly common, but inconspicuous on the brown twigs. On *Q. robur* and *Q. sessiliflora*.

20. *A. radialis* Fabr. The agamous generation of the last. Occurs usually at the base of the trunk on a level with the ground, but occasionally may be found a few feet up the tree. Pale yellowish or pink at first, then rich brown, turning darker at maturity. Multicellular. Firm, with a consistency about equal to that of a new potato at first, but becoming woody towards maturity. Fairly frequent. On *Q. robur* and *Q. sessiliflora*.

21. *A. gemmatus* Adler. Sexual generation. Small inconspicuous galls in buds on the green twigs. They mature in July. On *Q. robur* and *Q. sessiliflora*.

22. *A. quercus-corticis* Htg. The agamous generation of the last. Occurs in the bark of the tree where it has been injured, usually by the cutting off of a branch. The old scars of the gall-cells may be frequently seen in rows, but the fresh galls are inconspicuous. On *Q. robur* and *Q. sessiliflora*.

23. *A. testaceipes* Htg. Sexual generation. Small spindle-shaped swellings up the leaf petiole or mid-rib. The fly emerges in August of the same year. On *Q. robur* and *Q. sessiliflora*. We also have a few records of it on *Q. cerris* (*London Naturalist*, 1926).

24. *A. sieboldi* Htg. The agamous generation of the last. Conical bright scarlet or crimson galls becoming dull brown on maturity, rising through the bark of young bushes or on twigs springing from old stumps close to the ground. They are often covered with soil and decaying vegetation. Owing to this they are not often seen unless searched for. On *Q. robur*.

25. *A. nodifex* Kieff. Sexual generation. Very similar to *A. testaceipes*. Added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919).

26. *A. rhizomae* Htg. The agamous generation of the last. Somewhat similar to *A. sieboldi*, but it breaks through the bark in a different manner. When the red skin falls off, it discloses a cone, not so pointed as that of the other species. Added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919) for the north. It has since been found by us in Surrey. On *Q. robur*.

27. *A. inflator* Htg. Sexual generation. A fleshy swelling of the twig near the end, with a cavity in the centre, inside which is a small gall-cell. Frequent some years in the spring. On *Q. robur* and *Q. sessiliflora*.

28. *A. globuli* Htg. The agamous generation of the last. A bright green spherical gall with a fleshy covering to a hard interior, in buds on twigs. Develops rapidly, and falls to the ground when mature in September. Very plentiful some years. On *Q. robur* and *Q. sessiliflora*.

NOTES AND OBSERVATIONS.

TO CONTRIBUTORS.—The Editor would be most grateful if contributors would be so very kind as to adopt invariably the following procedure when drafting notes and other matter intended for publication :

(1) Write (or preferably type) on one side of the paper only ; leave a good margin and plenty of room between the lines.

(2) Draft the note as it is intended to appear, *i. e.* complete with heading and name (preferably in block letters) and address. When several notes are sent in together each should be on a separate piece of paper and complete in itself.

(3) Give both generic and specific names in full, underlined, with a capital letter for the generic name but not for the specific name, *e.g.* *Pieris brassicae*, not *PIERIS BRASSICAE*, nor *Pieris Brassicae* ; nor on any account *P. brassicae*.

It may in future be necessary to return manuscripts which do not comply with these very simple rules. Manuscripts cannot in any case be acknowledged unless accompanied by a stamped envelope or postcard addressed to the contributor.

VARIETIES OF *AGRIADES CORYDON*.—During five days' collecting on the South Coast just completed I had the good fortune to take several nice aberrations of *A. corydon*. The best among them were the following : (1) A male ab. *parallela* ; (2) a male ab. *striata* ; (3) a gynandromorph with the right side entirely of the male coloration, the left side being female ; (4) an ab. *irregularis-obsoleta*, male, the left hind wing only being completely obsolete ; (5) a male ab. *cinnus*, with hind wings completely obsolete ; (6) two nice gynandrous specimens. All are in bred condition except No. 3. The *striata* is especially fine, as all the stripes go right through to the base of the wing, passing the discoidal spots. *Corydon* was in thousands ; only once before have I seen the species so abundant, and never more so.—A. E. STAFFORD ; 83, Colborne Way, Worcester Park, Surrey.

COLIAS CROCEUS IN HAMPSHIRE.—On August 18th I saw several *Colias croceus* at Farley Mount, near Winchester. They were evidently early members of a fresh visitation, all apparently being males.—(Rev.) J. E. TARBAT ; 1, Romsey Road, Winchester.

POLYGONIA C-ALBUM IN HAMPSHIRE.—When at Selborne on September 4th last I saw a *Polygonia c-album* at rest on bramble at the top of the Hanger.—WILLIAM E. BUSBRIDGE ; 1, Bushy Avenue, Crofton, near Orpington.

POLYGONIA C-ALBUM IN SUSSEX.—At Storrington, in Sussex, where I often stay for a short time in August, I first heard of the appearance of this butterfly near there in 1929 ; in 1930 I saw a few and last year quite a number appeared ; two or three were also seen

this year. All seen appear to have been of the typical form. About five years ago I remember seeing the *hutchinsoni* form near Arundel, but unfortunately did not take down the date. This year in the New Forest, near Lyndhurst, where the butterfly has appeared frequently during the last few years, I came across both forms of *c-album* within a week; I took var. *hutchinsoni* on August 1st, and the typical forms on the 6th and 7th. All were in excellent condition. As regards immigrant butterflies at Storrington this year, I saw less than a dozen *Colias croceus*, which is generally plentiful near there, two or three *Pyrameis cardui*, and a fair number of *Plusia gamma*.—E. C. G. PINHEY; 36 Wetherby Mansions, Earl's Court Square, S.W. 5.

GYNANDROUS EUCHLOE CARDAMINES.—Last year five half-grown larvae of *E. cardamines* were found in the garden feeding on Rocket. Three pupae resulted. From these a male butterfly emerged on June 2nd this year. About a week later upon examining the remaining two pupae I noticed that the imagines appeared to be nearly fully developed, but the wing coloration seemed faded, such as may be seen in old, dead, fully formed pupae. Considering them dead I put them away in a cardboard box, containing a few small screws and bolts, for future examination. Happening to open the box two days later I was surprised to find that both had just emerged. One was on the bottom of the box, under a few bits of ironmongery, whilst the other had a precarious foothold on the smooth side of the box, hanging sideways, with wings curved. Both these show strong gynandromorphism; they are females with an unusual amount of the male orange peppered and streaked on each fore wing—both upper- and undersides. The specimen from the bottom of the box is a hopeless cripple, but the other set quite respectably and is possibly one of the finest varieties of this class. I now have 50 or so pupae reared from local ova, but can another such piece of luck be expected? By the way, I found that these larvae readily took to the seed-pods of Brussels sprouts, and also a tiny cress about two inches high, which grows here as a weed. I might also report a variety of the female bred in 1931, also from garden larvae, which has an extra double-lined distinct spot placed about an eighth of an inch below the discal on the underside of the fore wings.—G. B. OLIVER; Hazlemere, High Wycombe.

ABERRATION OF ARGYNNIS AGLAIA.—While visiting a certain locality in the Mendips during the second week in August, where *A. aglaia* was flying abundantly, I was lucky enough to capture a very interesting aberration of this species. Both fore and hind wings of the specimen, which is a male, are almost entirely sooty black, with the exception of a small fulvous patch situated in the discal cell. The underside is also interesting, the fore wings having black areas between the nervures, giving the impression of long black streaks. The hind wings are dullish, an interesting feature being that although the spots are situated in the normal positions, those comprising the

outer row parallel to the hind margin are much enlarged and entirely black, while those further in are of steel blue rather than of the customary silver colour. Unfortunately the specimen is not in good condition, the margins of the wings being in places badly chipped.—J. G. FRY; North Hill, Downside, West Town, near Bristol, September 18th, 1932.

SOME NOTODONTIDS IN KERRY.—Determined to procure larvae of *Leucodonta bicoloria*, I selected a wood of natural growth among the mountains near Kenmare. The timber consisted of birch, oak, holly and mountain ash, and had hardly been interfered with by human agency. On July 21st and 22nd of this year I beat about 70 birch trees, those so situated as to permit a sheet being placed under them and of not too great a height for a 10 ft. pole and a 6 ft. wielder of it. On the first day of operations on the birches on the outskirts of the wood I secured two full-grown larvae of *Odontesia carmelita*. These handsome larvae, with their spiracular line made up of alternate dull, light yellowish-white and coral-pink beading, reminded me at the first glance as they lay on the sheet of the larvae of *Calocampa exsoleta*. This find was encouraging, as this is the first record of the occurrence of this Prominent in Ireland. The larvae formed cocoons on July 26th, and shortly later on one turned into a healthy pupa; the other died in the cocoon. On the second day, July 22nd, I beat the birches in the interior of the wood, and procured three half-grown larvae of *Leucodonta bicoloria* and two young *Stauropus fagi*. There can be no mistaking the *L. bicoloria* larvae; Notodontids they were, and the only other of the family with the same resemblance would be *Drymonia dodonaea* (*trimacula*), but the latter has red circles round the spiracles and is yellower on the back; moreover, in England at least, it feeds mainly on oak, though said to be found on birch also on the Continent. The *L. bicoloria* larvae have now formed cocoons, but the contents so far have not been examined. The actual site of the wood of my selection I do not wish to divulge, but it is in the Kenmare River basin, as is Ardtully Wood (twelve miles distant), in which Kane reported the presence of *L. bicoloria* and *S. fagi*. The other Prominent larvae beaten from birch were one *Notodonta dictaeoides* and several *N. dromedarius*.—C. DONOVAN, Lt.-Col. I.M.S. (retired); Bourton-on-the-Water, Glos, August 18th, 1932.

NOTES ON IMMIGRANTS IN S.W. KENT AND N.E. SUSSEX.—*Plusia gamma* was first seen on May 19th and has been common everywhere. *Pyrumeis cardui* was noted at Westwell August 15th and Sandhurst August 20th, 28th and September 9th. *P. atalanta* has been more plentiful than for some years past on Buddleia in my garden. *Colias croceus* was taken at Westwell August 15th and 27th, Wye August 14th. Sandhurst August 17th and 20th, Northiam August 18th, Dunton Green August 26th, and Tenterden September 15th. Larvae of *Heliothis peltigera* were found in small numbers at Dungeness on August 20th.—(Dr.) G. V. BULL; Sandhurst, Kent.

RECENT LITERATURE.

A Naturalist in the Guiana Forest. By Major R. W. G. HINGSTON, M.C., M.B. London: Arnold & Co., 1932. Pp. xvi + 384. 16 plates, 150 text-figs. Price 18s.

Major Hingston's latest book breaks entirely new ground. It is the first from his pen to deal with the vast tropical forests of South America, and the only book to treat primarily of the fauna of the tree-tops. The author led the expedition sent out in 1929 under the auspices of the Oxford University Exploration Club for the purposes of getting into the roof of the forest, and examining the very rich fauna known to exist there, but rarely seen. The book is divided into two parts and an appendix. Part I, the general narrative, describes the arrangement of the camp, the main features of the forest, the working methods devised, and the means by which after no little difficulty observation points were eventually established in the tree-tops, the average height of which was about 100 ft above ground. Of the remainder of the book five chapters are devoted to detailed descriptions of the snares, habits, nests, etc., of spiders, and are full of extremely interesting observations. Chapters XI to XV deal similarly with insects, and are packed with notes on the habits of a very large number of insects. Protective devices have particularly attracted attention, including mimicry; and the host of examples noted should convince the most sceptical of the truth of the relevant theories. Many instances of warning coloration are also given. Hemiptera were found to be the predominant order in the tree-roof, and even moths were found which were such faithful copies of certain common species belonging to that Order that they completely deceived the author. In the last chapter a brief general summary is given. One of the most interesting facts that emerged was the definite horizontal stratification of the insect fauna at different levels. The total dissimilarity of the tree-roof and ground faunas was to some extent bridged by the occupants of the intervening zones. A feature of the collections, as of most others from this region, is the extraordinary paucity of individuals as compared with the great wealth of species. Now that Major Hingston has blazed the trail, it is to be hoped that others will follow, and so add by degrees to our knowledge of the vast tree-top fauna hitherto known only from those fragments which descend here and there along the curtains of the river banks and the rare clearings in the forest.

British Museum (Natural History).

Fascicle 3 of Part V of the *Diptera of Patagonia and South Chile* was issued in April. It completes the Part, and, in about 100 pages, contains accounts of the Rhagionidae, Therevidae and Lonchopteridae by J. R. MALLOCH, the Scenopinidae and Mydidae by F. W. EDWARDS, and the Asilidae by S. W. BROMLEY. In May a third edition of the economic pamphlet dealing with the Bed-bug, revised and expanded by Major E. E. AUSTEN, was issued, and in July a third edition also

of Dr. GAHAN's Furniture Beetle pamphlet, revised and expanded, especially in respect of methods of control, by F. LAING, was published.

Union of South Africa.

From the Department of Agriculture a number of Bulletins, Reprints and Memoirs of entomological interest have been received. They are mostly severely practical in their application. Among them are two reprints (47 and 74) from *Farming in South Africa*, dealing with the control of Termites, but not, apparently, embodying any new technique. Memoir No. 7 contains a valuable biological study of *Aphis leguminosae* by VAN DER MERWE, and accounts by RIPLEY and HEBURN of the olfactory reactions of the Fruit-fly, *Pterandrus rosa*, which, though investigated with economic objectives and in continuation of work of which accounts have already been published by the same authors, contain much information of more general interest.

U.S. Department of Agriculture.

The Technical Bulletins recently received comprise No. 275, Biology and Control of the Blueberry Maggot (*Rhagoletis pomonella*, Diptera) by LATHROP and NICKELS (76 pp.); No. 281, Experiments with Insecticides for Codling Moth Control, by NEWCOMER and GOTHERS (28 pp.); and No. 294, Biology and Morphology of the Braconid *Chelonus annulipes*, by A. M. VANCE (48 pp., and many excellent illustrations of morphological details). There are also a circular (No. 221) dealing with *Pissodes strobi* (Col.), and two Farmer's Bulletins (Nos. 1670 and 1691) dealing with hydrocyanic gas and the control of grasshoppers respectively.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*June 9th.*—The President in the Chair.—An exhibition of Living Objects of Natural History was held. Mr. de Worms exhibited a *Rumicia phlaeas* with only two spots on each of the fore wings; Mr. Jacobs, a larva of *Ocypus* sp. (Col.), the host of two Proctotrypid (Hym.) parasites, from Bromley, Kent; Mr. Wakeley, larvae of *Hypena proboscidalis* and of *Pterophorus galactodactyla*, taken at the Mickleham Field Meeting, and of *Epione vespertaria* from York; Mr. Hawkins, three forms of the larva of *Trichiura crataegi*; and Mr. Main, larvae of the snail-eating beetle, *Hydrophilus piceus*. A large number of lepidopterous larvae were exhibited, and many notes on the season in the field were communicated.

June 23rd.—The President in the Chair.—Mr. H. Moore exhibited a gynandromorph of *Anthophora acervorum*; Mr. Eagles, a pupa of *Strymon pruni* and larvae of *Anticlea badiata*; Mr. Howarth, larvae of *Leucoma salicis* from Canvey Is.; Mr. Syms, a larva of the ant's nest Dipteron, *Microdon eggeri*, from Byfleet; Mr. Niblett, a number of species of *Trypetidae* (Dip.). Mr. R. Adkin read notes on the occurrence of *Roesilia (Nota) confusalis* in his garden at Eastbourne; and reports of recent captures and observations were communicated.—*Hy. J. TURNER (Hon. Editor of Proceedings).*

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HEODES PHLAEAS L.. AB. *BERVINIENSIS* NOV. AB.

By P. SIVITER SMITH.

THIS insect has already been recorded (*Entom.*, 1930, **63**: 281), but as some comment has been aroused by it I thought an illustration might be of interest. It may be described as follows:

Wing expanse 32 mm. Head, thorax and abdomen normal: fore wings with outer margin dull brownish black. A small patch of dull, yellowish copper extends from the inner margin to the basal part of the discal cell, gradually disappearing about half-way along the submedian line. The remainder of the wings is black, the true black of the usual spots, and it contrasts quite clearly with the outer margin. There is no trace of the ordinary spots, but there is the very faintest suspicion of copper colour in the black when viewed under a glass, this being produced by isolated copper scales. The hind wings have the orange-red band partly obscured, and a faint trace of copper colour near the base, which is, however, not unusual.

The *underside* of the fore wings is beautifully streaked and suffused, the darkest spots being the usual black, with paler greyish suffusions on the usual yellowish-grey background. The very light areas near the discal cell are pale yellow tinged with orange. The hind wings, except for being practically unspotted, are otherwise normal.

The general aspect of the insect will be more readily grasped by reference to the enlarged figures of the upper- and undersides. The subject was a difficult one to photograph (panchromatic plates were used, with an Ilford gamma filter), and the sides are not equally illuminated, the light being on the left-hand side of the camera. This explains the difference in shades of the left and right-hand sides of the insect.

As far as I can find out there is no specimen similar to this one. I thought it possible that a specimen exhibited in 1928 by Mr. Arthur F. Griffith might be similar to mine, but he very kindly told me that "his (his nephew's) specimen is not similar to yours. His is bright coppery for, say, one-third of the fore wings near the base and black over the rest."

Mr. Riley was good enough to send the following note about my specimen: "This is the aberration which usually is called '*melanophlaeas* de Villiers.' This name, however, really applies to nothing more than *eleus*. The confusion has arisen from the

fact that Oberthür in 1896 figured a specimen somewhat similar to yours, and quite erroneously attributed the name *melanophlaeas* to it. This specimen is now in the British Museum: yours differs from it mainly in the reduction of the red band on the upperside of the hind wing, and in having the discal spots on the underside of the fore wing enormously expanded as shown in your photograph. It appears therefore to be nameless."

Ab. *melanophlaeas*, Vill. and Guén., is described as follows: "Differs only from *phlaeas* in that the fore wings are entirely brown, and only lightly powdered with golden-tawny (fauve-doré) at the base; the hind wings with the whole or part of the ante-marginal tawny band also sometimes obliterated." I have already mentioned that the suffusion is black, not brown, so the name *melanophlaeas* can hardly apply.



Heodes phlaeas ab. *herviniensis* nov. ab.
(Considerably enlarged)

In ab. *turcius*, Gerh., the fore wings are suffused with brown, but the shape of the copper area is very different, Tutt describing it as "confined to a longitudinal stripe running from base to outer marginal band, and including the discal spots . . .," etc., this being only in the female, too.

Ab. *fuscata*, Tutt, is close, being described as having "the fore wings suffused with blackish brown, including the discal and submarginal areas, through which only a faint suffused tinge of copper appears; the hind wings with copper marginal band and not tailed."

I can find no description of any specimen with the markings of the underside similar to my specimen.

This is obviously a purely aberrational form, but it is a type of variation which is much studied, so that although the species is already heavily burdened with varietal names, I think it will probably help those who are interested in this question if I call the specimen ab. *herviniensis*, nov. ab.

The insect, a male, was taken flying near a brook on one of the Berwyn Mountains between Cynwyd and Llandrillo, North Wales, on August 24th, 1930.

I visited the same place about the same time of year in 1931, and the variation of the species seemed then rather to point to a reduction in size of the black spots on the fore wings, and a rather greater copper suffusion of the hind wings than in other specimens I have, approaching vars. *subradiata*. Tutt, and *aurontiens*, Schultz.

GYNANDROUS POLYOMMATUS ICARUS IN CO. GALWAY.—During the last few years Mr. L. A. E. Sabine has been collecting *Polyommatus icarus* each summer in co. Galway, where the species is single-brooded. In 1926 he found a strong colony distributed over a wide area of rough, broken ground on limestone formation a considerable distance inland, unlike most of the known habitats of the species in the west of Ireland. The forms occurring here are generally very similar to those in other single-brooded areas, though extreme blue forms of the female are more frequent than in the districts I have worked in Mayo and Sligo, and there is perhaps less tendency towards obsolescence of the spots on the underside of both sexes. By far the most interesting feature of the colony is the large number of gynandromorphs it produces. Mr. Sabine has taken nearly fifty in seven years. They have turned up regularly each year in fairly even numbers as follows: 1926 (2), 1927 (5), 1928 (6), 1929 (8), 1930 (7), 1931 (13), 1932 (7). I believe it is a generally accepted fact that *icarus* is more prone to this form of variation than any other British butterfly, but the large number obtained in this one district can seldom, if ever, have been equalled elsewhere. The majority of the specimens have the wings equally divided ♂ and ♀; a considerable number are similar but with just a trace of ♂ scaling on one or both ♀ wings and *vice versa*, and a few have ♂ and ♀ scaling strikingly mixed on one or more wings. Only one or two are of the form one would perhaps expect to be most frequent, *i. e.* normal ♀ with a streak or patch of ♂ on one wing. I have had the pleasure of seeing all the gynandromorphs each year as taken, and a few of the most interesting are in my collection. It must not be assumed that the locality is a second Royston! As a matter of fact singularly few other aberrations have turned up in the district, although it has been worked for four or five weeks each year.—S. B. HODGSON; St Philip's, Charles Street, Berkhamsted Herts.

ACHERONTIA ATROPOS IN EAST LONDON.—On September 25th an *Acherontia atropos* was found in Leman Street, Dock Street, E. 1, outside the Wholesale Co-operative main building. It appeared to be struggling along preparatory to flying, but was very weak and easily captured.—JUSTUS HILL; 153, Jerningham Road, New Cross, S.E. 14.

PYRAMEIS ATALANTA IN WINTER.

BY H. W. HEAD.

HAVING read with much interest Mr. W. G. Sheldon's article on this subject, perhaps my experience with this butterfly may also prove interesting. For nearly fifty years I have tried to keep *Pyrameis atalanta* alive throughout the winter, with the intention of breeding them on in the spring, and I came nearest to success in the spring of the present year.

In February, 1907, I wrote to the *Entomologist's Record* (p. 47) suggesting that this butterfly did not hibernate, and could not survive the winter in this country in any stage. The bulk of opinion then was against my suggestion, and a number of records were published discrediting my theory. During the twenty-five years since 1907 I have kept *P. atalanta* in one stage or another every winter. I keep them in a large cage at an open window of a cool glass-house, which ensures conditions of temperature similar to those of the south of England. Many times they have paired in September or October, and deposited ova abundantly during October and November on sunny days. Several times I have kept a number of the ova under natural conditions out of doors to see if perhaps the eggs would survive the winter, but in no case did any of them hatch: on the other hand, the ova from the same broods kept in a warm room hatched in a few days, and those left in the cage in the glass-house took four to five weeks to hatch, mostly hatching during December. All the latter larvae died off by January, when the nettles had all died down. On one occasion a few very small larvae did survive for a time, spun up in the dead leaves, the weather then being very cold. I forced some nettle into leaf in a heated house by the end of February, and three larvae were still alive. These I placed on the young nettle in the heated house, and they began to feed at once, and grew rapidly. However, two of them lived only until about half grown, and the third survived until about full grown, and then died with diarrhoea, due I think to the succulence of the forced nettle.

I have many times tried keeping the pupae through the winter out of doors in a wooden cage, glass fronted, with perforated zinc ends, suspended on a wall of north aspect. Usually the pupae were all living in February, when I removed them into a living-room, hoping they would emerge in March. The imagines developed fully in most of the pupae, but not one emerged. They appeared to die when just on the point of emergence, apparently owing to the long duration in the pupal state, which left them too weak to break through the pupa-case. I have kept imagines that have

emerged in August, September, October and November, but in every instance they have nearly all died by the end of February, only a few odd specimens surviving until March. In the autumn of 1931 I had over two dozen *P. atalanta*, caught during September and October in my garden and breeding-ground. Unfortunately in November I became seriously ill and was laid up for nearly six months. The care of the insects devolved upon my niece, for many years an ardent student of mine. She gave close attention to the *atalanta*, and in March of this year, 1932, there were still four living. In April the number had dwindled to two, and both were females. One of these died early in the month; the other began depositing ova freely on every sunny day, and I had hopes of at last succeeding in bringing *P. atalanta* through the winter, but, alas, the ova all proved infertile and the butterfly died at the end of April.

At the present time, September 15th, 1932, I have five living *atalanta*, one from Manchester, two sent me from the New Forest, one from the Wye Valley, and the other caught in my breeding-ground. One of these is depositing ova, but whether fertile or not has yet to be proved.

So much for long observation and experience, which led to my suggestion that *P. atalanta* does not hibernate. Hibernation infers a dormant state, but *P. atalanta* is subject to activity the whole winter through; with every gleam of sunshine, even in January, when the temperature was no more than 40° F., if the sun shone, this species would crawl from its hiding-place, and sip honey from a sponge; and as soon as the sun had gone, creep back into hiding and become dormant again, until further sunshine or a rise in temperature renewed its activity. *P. atalanta*, like *P. cardui*, needs feeding on honey or syrup, and also needs water to drink frequently if it is to survive the winter, but no truly hibernating species does.

The fact that this butterfly is met with every month during the winter is no proof of hibernation, as many have averred, but surely points to the opposite conclusion. *Atalanta* is really one of the hardiest species of butterflies, and is often active when it is far too cold for any other butterfly to move. I am of the opinion that in the south of England, during a fine autumn, there is sometimes a late second brood, such as I get in my breeding-cage, and some few of these no doubt feed up when the autumn is very mild, as it often is in this country. The fully fed larvae frequently wander a good distance before they spin up to pupate, and may, so late in the year, crawl into barns, outhouses, or haystacks for that purpose, seeking by instinct a warm situation. Should the winter be mild the pupae would slowly develop, and when a warm spell occurred the butterflies would emerge, and the first gleam of sunshine would set them

on the move, which I think accounts for the fine fresh specimens recorded during winter months. The imagines, too, live for a long time, and when the weather is very cold will remain stationary for weeks without food, but with a slight rise in temperature they become active and need food, if they are to live through another period of inactivity successfully.

Why is it that collectors have been so slow in acknowledging the fact that we depend entirely upon migrants every year for our supply of *P. atalanta*? It has long been acknowledged that we are dependent on migrants for our supply of *P. cardui*, yet these two butterflies are identical in habit and life-history, though *atalanta* is much hardier than *cardui* and lives in a semi-torpid condition for a longer period. *P. atalanta* has also resting periods in excessively hot weather as it has in cold; but in winter the severe cold periods usually continue too long for the butterflies to survive.

The crux of the whole question is, "What is 'hibernation'?" Is it a state of complete coma for a certain season, governed by certain physical laws, such as the true hibernation of the *Vanessas*, etc., or can the haphazard semi-torpid condition of the *P. atalanta* and *P. cardui*, affected by any chance disturbance, be designated as hibernation?

Finally, "Are *P. atalanta* and *P. cardui* in a transition condition, slowly evolving into true hibernating species?"

Burniston,

nr Scarbrough.

RELATIVE ABUNDANCE OF LEPIDOPTERA.—This part of Monmouthshire is usually a good district for insects; but this summer they have been very scarce. Even *Epinephele jurtina* and the whites (*Pieris*) have been few and far between. But I was staying at Porthcawl (Glamorgan) from August 6th to 30th, and the difference there was most striking. *Pieris brassicae* and *P. rapae* were everywhere, even in the town, and I found *Epinephele tithonus* in abundance on bramble. But the most prolific spots were among the sandhills along the coast. Here, in addition to *Colias edusa* of which I took six and saw many more, *E. jurtina*, *Satyrus semele*, and *Polyommatus icarus* were in abundance; *L. astrache* only slightly less so. *Heodes phlaeas* and *Pararge megera* were common, and there was a sprinkling of *Vanessa (atalanta, cardui and urticae)*. *Plusia gamma* was all over the place, and I took one *Heliothis peltigera*. I did not do any night work, but judging by the moths seen by my headlights when driving, I should say that the Noctuids must have been abundant also. On returning here I found the Lepidoptera about as scarce as before I went away. As Porthcawl is only about 50 miles from here, and this place is only about 15 miles from the Bristol Channel, it would be interesting to know how to account for this great difference in distribution.—G. F. CROWTHER; Bettws Newydd, Usk, Mon.

AFRICAN BEES OF THE GROUP SELADONIA.

BY T. D. A. COCKERELL.

THE subgenus *Seladonia* of *Halictus*, described by Robertson as a genus, is very characteristic of the palaearctic and nearctic regions, though the species are not very numerous. It is interesting to find that it extends through Africa, even to the extreme south. The species are closely allied to those of the north. The following were collected in 1931:

Halictus (Seladonia) jucundus Smith.

Cape Province: Oudtshoorn, Oct. 31st (*Ckl.*) Whitehill. Nov. 26th (*Ckl.*).

Halictus (Seladonia) banalianus Strand.

S. Rhodesia: Victoria Falls, Sept. 23rd. ♀ (*W. P. C.*). Five spines on hind spur. The specimen has collected a quantity of white pollen. Described from the Belgian Congo.

Halictus (Seladonia) austrovagans n. sp.

♀. Length about 4 mm.; head, thorax and abdomen yellowish green; pubescence scanty, white, the hind margins of tergites with rather broad but thin dull white hair-bands; head large, broader than thorax, face very broad; mandibles rufous, paler basally; flagellum clay-colour beneath; clypeus shining, with strong punctures, apical margin broadly black, disc flattened; supraclypeal area shining brassy in middle; front dull; mesothorax closely punctured but shining; scutellum like disc of mesothorax; area of metathorax not very large, dull, with a shining margin; tegulae hyaline; wings clear; stigma very pale yellowish; nervures pale; legs black, with knees, anterior tibiae in front, the other tibiae at base and apex, and the tarsi, light ferruginous; abdomen short and broad, shining. Microscopical characters: Hind spur with a long oblique tooth, then a low rounded lamella, and then three very low crenulations (style of *H. duponti* Vachal, a much larger species); tergites punctured, not striate; front striate, with rows of punctures between the striae; mesothorax densely punctured, with the punctures running more or less in grooves; area of metathorax plicate and subreticulate; first recurrent nervure joining second cubital cell at beginning of last third.

Cape Province: Nieuwoudtville, Nov. 18th (*A. Mackie*). The tergites are not banded with rufotestaceous, as they are in *H. atroviridis* Cam. (*aethiopicus* Cam.). Except for the small size, it is very like the European forms of *Seladonia*.

Halictus (Seladonia) diductus n. sp.

♀. Length about 6.3 mm.; head, thorax and abdomen brassy green, shining; pubescence rather long and abundant, pale greyish, pale fulvous on head and thorax above, the hind margins of tergites with slightly yellowish bands; head large, a little broader than thorax, face very broad; mandibles with a red band somewhat beyond middle; scape very long, flagellum short, black, with a scarcely perceptible brownish tint beneath; clypeus shining, strongly punctured, the lower margin broadly black, and above the black with a coppery suffusion; supraclypeal area shining, its lower part coppery; face quite hairy, the hair greyish, slightly yellowish, not white; front dull; cheeks broad, shining; mesothorax and scutellum shining, but closely punctured; area of metathorax large, dull and sculptured, including rim, but adjacent sides of metathorax shining; sides of apical truncation not sharply margined; mesopleura dull, obscure green; tegulae pale testaceous with hyaline margin; wings greyish, stigma extremely pale, nervures pale; second cubital cell receiving recurrent nervure at about the beginning of its last third; legs black, hairy, the tarsi light rufous, the front and hind basitarsi more or less blackened; abdomen broad, shining.

Cape Province: Port Elizabeth, Oct. 29th (*A. Mackie*). This differs from the other small or smallish *Seladonia* in the collection by the darker legs, but the anterior tibiae do show a band of red in front under the pubescence. The tergites are not banded with rufotestaceous. The hind spur has four spines, the first three long. By the last character the species falls with *H. hotoni* Vachal, which is, however, considerably smaller, with the tibiae and the flagellum beneath testaceous.

Halictus (Seladonia) hotoni Vachal.

Belgian Congo: Dilolo, July 24th, 2 ♀ (*W. P. C.*). Vachal says there are four spines on the hind spur. I found four long spines, but a more or less rudimentary fifth is sometimes visible, and on one spur I found seven spines in all, there being a couple close together, just before the normal first spine. One of the specimens has the abdominal hair-bands almost entirely rubbed off, giving it a peculiar appearance. This species was described from Delagoa Bay, but extends across Africa to Angola.

COLIAS CROCEUS IN WEST CORNWALL.—On September 24th I saw an apparently quite fresh *C. croceus* flying in the railway-cutting by the golf links at Lelant. On September 28th I saw one flying over the cliffs opposite Godrevy Lighthouse; and on October 1st my niece saw another flying along the road between the Lizard and Helstone.—*HAROLD HODGE*; 9, Highbury Place, N. 5.

LEUCOMA SALICIS IN LONDON.

BY RUSSELL JAMES, F.E.S.

UNTIL July, 1930, I had seen no *Leucoma salicis* in the London district since 1900, nor indeed anywhere in the country since 1908. My son, who took an interest in insects from very early boyhood, had never seen it alive.

We have been motoring along the Lea Bridge Road. Clapton, daily since 1924, always on the look-out for moths on the poplar trunks. We have frequently found *Acronycta megacephala*, *Amorpha populi*, *Cerura vinula* and *Cossus ligniperda*, but, until 1930, no *Leucoma salicis*. It was therefore with great interest that, on returning home from Brighton on July 13th of that year, we spotted a large white moth on a poplar trunk just by Lea Bridge Road Station, which, on investigation, proved to be *Leucoma salicis*. We found freshly emerged moths all over and around this group of poplars—on the grass, walls and fences, and the trunks were smothered with their cocoons. Having plenty of boxes in the car, we took a renewal series then and there, and for days as we passed along the road on our journey we saw numbers of specimens just round this one particular spot—the large poplars just by the competitors' entrance to the Dirt-track.

In 1931 they had spread to the long lines of Lombardy poplars each side of the Lea Bridge Road between the railway bridge and the River Lea—the larvae swarming over the trunks in late May and June. I was away all the time the moth should be out, so I do not know what numbers there were.

They evidently flourished, as this year in July the numbers were greater than ever. They had forsaken the original group of trees, but the fence in front of the Lombardy poplars on the south side of the road on some mornings accommodated many hundreds. How many there may have been on the other side of the fence facing the trees one can only guess. They continued well into August, but were extremely local. Very few were seen even on the poplars the other side of the road, and none elsewhere.

I should be most interested to hear whether this abundance has been found elsewhere in the London suburbs or in the country, or whether this is an isolated colony. The only parallel in point of numbers in my experience was as far back as 1885, when, as a small boy, I found a row of young poplars bordering the Deal sandhills crowded with freshly emerged moths and numberless batches of eggs. On that occasion there was no continuity of the colony, as at the same place in the following year only a single

specimen was found. From the numbers of moths this year, unless some hostile force intervenes, there should be enough larvae to defoliate the poplars entirely, and I shall watch their progress with much interest.

Dial House,
Ongar Park,
Essex.

PYRAMEIS CARDUI IN SOUTHERN NIGERIA.—*Pyrameis cardui* turned up in south-eastern Nigeria again last year (1931). The first specimens were seen on September 15th, 1931, at Okigwi, a station about 100 miles inland and situated among rocky and hilly open country at an elevation of about 1000 ft. On October 6th I was transferred to Port Harcourt, which is situated among the mangrove swamps; and I was surprised to see *cardui* there also, but only in small numbers. The last were seen about October 15th, 1931, so the flight lasted one month only. None has been seen so far this year (1932). At Okigwi at the end of September, 1931, *cardui* was very common indeed, and it was possible to see perhaps a dozen at once having an aerial rough-and-tumble. The insects were active and wary, and the flight was rapid and erratic in the extreme. The flower-beds in the station were liberally adorned by this most beautiful species. As in previous years, the specimens were rather small. On October 5th, 1931, at 11.0 p.m. a fine specimen came into the house to an acetylene table-lamp, round which many moths were already fluttering, and was captured. I heard that *cardui* had come to light at night in other houses in the station. Last year's visitation was at approximately the same time of year as the flights of *cardui* in south-eastern Nigeria in 1929 and 1930 (see *Entomologist*, 64: 39). It will be interesting to see if they put in an appearance again this year (1932); on the analogy of previous seasons they are just about due.—I. R. P. HESLOP, M.A. F.E.S., Nigerian Administrative Service; Port Harcourt, Owerri Province, Southern Nigeria, British West Africa, September 13th, 1932.

MYELOIS NEOPHANES IN SUSSEX.—At a field meeting of the South London Entomological Society at Broadwater Forest on June 19th, I beat a fine specimen of this species from Scotch Fir. I do not remember seeing any record of this local moth having been taken in Sussex previously. Meyrick's *Revised Handbook* gives Surrey, Dorset and Devon, and it has been recorded from the Isle of Wight (*Ent. Mo. Mag.*, 1929, p. 20).—S. WAKLEY; 8, Woodland Hill, Upper Norwood, S.E. 19.

ATTALUS MACKIEI, PIC.—This beetle, described in *Bull. Soc. ent. France*, 1931, p. 60, is said to be from "Arouna," Morocco. The locality is Arounda, alt. 1900 m., in the High Atlas. The variety *cockerelli* Pic., from Asni, is from a much lower altitude.—T. D. A. COCKERELL; University of Colorado, Boulder, Colorado, October 21st, 1932.

SOME CORNISH TRICHOPTERA.

BY MARTIN E. MOSELY, F.E.S.

DURING the month of August, 1932, Dr. H. A. Baylis and Mr. W. E. China, who were spending vacations in different parts of Cornwall, kindly collected Trichoptera and Neuroptera for the Natural History Museum Collections. As they have each written, at my request, a description of the localities in which they collected, it only remains for me to point to features of special interest in the collections they brought home.

Of the families of the British Trichoptera, only four are unrepresented—the Phryganeidae, Beraeidae, Molannidae, and Hydropsilidae. Amongst the Leptoceridae, of special interest is the capture of *Leptocerus bilineatus*, L., by Dr. Baylis. Dr. Baylis observed this insect, he tells me, in considerable numbers, and the pair he brought home are a welcome addition to the collection. Of interest also is *Stenophylax latipennis*, Curt., which is, in this country, practically confined to the south-west. *Diplectrona felix* was taken by both collectors, and there was a good series of *Tinodes assimilis*, McL., brought back by Mr. China.

Dr. Baylis writes as follows:

“The district of St. Gennys lies on the north coast of Cornwall about halfway between Bude and Tintagel. It is drained by two streams, each with several tributaries. One stream enters the sea at Crackington Haven, the other at Millook Haven. It was on these streams and their tributaries that all the places were situated at which Trichoptera were collected. The streams are probably nowhere more than three or four yards wide. All the collecting places were within about two miles of the sea, and none of them higher than about 200–300 ft. above sea-level. The only place at which collecting was attempted on higher ground (400 ft. or more) was a patch of open, marshy, uncultivated ground (locally called ‘moor,’ but scarcely meriting the term), through which runs a small tributary of the river Ottery. Sweeping among the rushes and other vegetation, and beating the bushes overhanging the stream, at this place proved entirely unproductive of Trichoptera.

“The country is mainly agricultural, the fields being devoted largely to grazing, but also partly to corn and root crops. It is very sparsely populated. The streams run at the bottom of steep-sided valleys, and are usually fringed and overhung by trees and bushes, which in most places extend only a few yards on either bank. The flow of water is only moderately rapid, though after heavy rain it may become torrential. In dry weather the streams are usually shallow, except for occasional deep pools. The bottom

is generally stony, and in places strewn with boulders of considerable size. There is an almost complete absence of water-weeds. Small trout appear to be fairly abundant in the streams.

"The most productive spots for collecting Trichoptera were the more open places, where a stream crossed a road or path. By beating the overhanging vegetation at such places specimens were often disturbed, and occasionally they were taken flying over the water. *Leptocerus bilineatus* and *Mystacides azurea* were only found skimming the surface of the water at fords. Very few Trichoptera were seen at a distance of more than a few feet from a regular stream. One or two were taken over trickles of water formed at the sides of the roads after rain, and one specimen of *Odontocerum albicorne*, carrying a mass of eggs, was caught flying slowly over an open meadow, along one side of which a stream ran. A single specimen of *Sericostoma personatum* was taken on the sea-shore at Crackington Haven, but this was not many yards from the mouth of the stream. *Diplectrona felix* appeared to prefer comparatively shady reaches of the streams where they were overhung by trees."

Mr. China writes as follows :

"The fauna of the Atlantic coast of the Penzance peninsula, Cornwall, is of particular interest, owing to the special conditions prevailing. In the first place the peninsula itself is almost entirely composed of granite. Secondly, the Atlantic coast is cut off from the south coast by a ridge of high barren hills extending from Carn Brea (657 ft.) near Land's End to Rosewall Hill (700 ft.) near St. Ives. The region thus isolated is totally different in character from the rest of Cornwall, particularly from the well-wooded slopes of the Mounts Bay littoral. The granite cliffs are about 200 ft. in height, and, in places, the ground slopes up to over 800 ft. within less than a mile from the sea. Owing to extreme exposure to winds, and to the barren granite subsoil, the region is devoid of trees, and maintains only a sparse vegetation of heather, gorse, bramble and bracken. It is intersected by a number of small rapid streams, none of which is more than two miles in length. In the steep-sided valleys of these streams the vegetation is more luxuriant, and a few stunted trees, particularly willows, occur. The Trichoptera were all taken along the lower reaches of the stream flowing down Rose Valley to Portherras Cove between the villages of Morvah and Pendeen. This stream ends in a series of small cascades and pools, and finally flows out over a few yards of sand to the sea. At high tide the waves break over the rocks at the mouth of the stream, rendering the last pool or two brackish. In spite of this, some larval caddis cases were seen on the rocks in these pools. Vegetation in the water itself consisted solely of

various mosses and algae. The margins, however, were fringed with a variety of low plants and grasses. The species taken were all collected within 25 yards of the high-tide level by sweeping the plants bordering the stream. *Philopotamus montanus* was extremely abundant and flew up in clouds. A few *Calopteryx virgo*, L., were also present."

In the following list, the initials "H. A. B." indicate that the species was taken by Dr. Baylis at St. Gennys, and "W. E. C." by Mr. China at Portheras Cove :

LIST OF SPECIES RECORDED.

Trichoptera.

LIMNOPHILIDAE.—*Stenophylax latipennis*, Curt. (H. A. B.).

SERICOSTOMATIDAE.—*Sericostoma personatum*, Spence (H. A. B., W. E. C.) ; *Lepidostoma hirtum*, F. (H. A. B.) ; *Crunoecia irrorata*, Curt. (H. A. B.).

ODONTOCERIDAE.—*Odontocerum albicorne*, Scop. (H. A. B.).

LEPTOCERIDAE.—*Leptocerus bilineatus*, L. (H. A. B.) ; *Mystacides azurea*, L. (H. A. B.).

HYDROPSYCHIDAE.—*Hydropsyche instabilis*, Curt. (H. A. B.) ; *Diplectrona felix*, McL. (H. A. B., W. E. C.).

POLYCENTROPIDAE.—*Polycentropus flavomaculatus*, Pict. (W. E. C.) ; *Plectrocnemia conspersa*, Curt. (W. E. C.).

PSYCHOMYIDAE.—*Tinodes assimilis*, McL. (W. E. C.).

PHILOPOTAMIDAE.—*Philopotamus montanus*, Scop. (H. A. B., W. E. C.) ; *Wormaldia occipitalis*, Pict. (H. A. B.) ; *Wormaldia mediana*, McL. (H. A. B.).

RHYACOPHILIDAE.—*Rhyacophila dorsalis*, Curt. (H. A. B., W. E. C.) ; *Agapetus fuscipes*, Curt. (W. E. C.).

Neuroptera.

Osmylus fulvicephalus, Scop. (H. A. B.) ; *Hemerobius micans*, Ol. (H. A. B.) ; *Hemerobius humulinus*, L. (H. A. B.) ; *Boriomyia betulina*, Ström. (H. A. B.).

Ephemeroptera.

Ecdyonurus longicauda, Steph. (H. A. B.).

Plecoptera.

Leuctra klapálecki, Kny. (H. A. B., W. E. C.) ; *Isopteryx torrentium*, Pict. (H. A. B.).

Odonata.

Calopteryx virgo, L. (W. E. C.).

GALL-CAUSING CYNIPIDAE IN BRITAIN.

PART II—continued.

BY M. NIBLETT, J. ROSS, AND H. J. BURKILL, M.A., F.R.G.S.

(Continued from p 235).

29. *A. curvator* Htg. Sexual generation. A firm fleshy green gall in the twig or leaf, generally near the base of the latter, causing curvature of the part attacked. There is a cavity in the gall which contains the larval cell. Plentiful in the spring most years. On *Q. robur* and *Q. sessiliflora*. One record on *Q. cerris* (*London Naturalist*, 1926). Also on *Q. intermedia* in Somerset (L. B. Hall, *London Naturalist*, 1922).

30. *A. collaris* Htg. The agamous generation of the above. A bud gall, brown and woody inside the bud scales. It develops rapidly in September and falls out. Not seen nearly so often as its alternate form. On *Q. robur* and *Q. sessiliflora*.

31. *A. pilosus* Adler. Sexual generation. A small hairy gall on the catkin. On *Q. robur* and *Q. sessiliflora*.

32. *A. fecundatrix* Htg. The agamous generation of the above. The well-known Artichoke gall, springing from a bud. On *Q. robur* and *Q. sessiliflora*.

33. *A. cirratus* Adler. Sexual generation. A small light brown oval gall covered with white hairs occurring on the catkins. Not common. On *Q. robur* and *Q. sessiliflora*.

34. *A. callidoma* Giraud. The agamous generation of the last. A bud gall, spindle-shaped on a stalk. Green, lined with red or purple. July and August. Not plentiful. On *Q. robur* and *Q. sessiliflora*.

35. *A. nudus* Adler. Sexual generation. A small oval gall, light brown in colour, naked, on the catkin. Scarce. On *Q. robur* and *Q. sessiliflora*.

36. *A. malpighii* Adler. The agamous generation of *A. nudus*. A bud gall in the axil of a leaf. Small, spindle-shaped, green, tinged with red. Scarce. September. On *Q. robur* and *Q. sessiliflora*.

37. *A. xanthopsis* Schl. Sexual generation. A small catkin gall. Added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919).

38. *A. occultus* Tschck. Sexual generation. Another catkin gall somewhat similar to the last. Also added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919).

39. *A. amenti* Giraud. Sexual generation. Also a catkin gall and very similar to the last two (see Cameron, 4 : 94. Recorded from Braemar by Trail, from Kew Gardens by Rolfe, and from

North Yorkshire, Durham and Northumberland by Bagnall and Harrison.

40. *A. seminationis* Adler. Agamous generation. Spindle-shaped galls, sessile or stalked. Usually on the catkins, but may be on the leaves. The catkin stalks thicken when carrying the galls (see *London Naturalist*, 1930, p. 137, J. Ross). Frequent in places some years. May and June. On *Q. robur* and *Q. sessiliflora*.

41. *A. quadrilineatus* Htg. Agamous generation. Irregularly ovoid galls on the catkins, brown to dark crimson or purplish in colour. Very plentiful some years. On *Q. robur* and *Q. sessiliflora*.

42. *A. marginalis* Schl. Agamous generation. Irregular fusiform, conical or oval galls on the margins of leaves, 3 to 3.5 mm. long by 2 to 2.5 mm. diameter. Green to purple in colour. We have only seen this on *Q. robur* as yet. Rather scarce. Cameron considered this species to be only a leaf form of the previous one.

43. *A. albopunctatus* Schl. Agamous generation. A bud gall in the shape of an elongated cone on the twigs, greyish to brownish-green or purplish, with white spots. May. Local. Sometimes very plentiful on one tree, but not to be seen on the adjoining ones. On *Q. robur* and *Q. sessiliflora*.

44. *A. solitarius* Fonsc. Agamous generation. A fusiform gall in the bud at the axil of a leaf. Light brown covered with brown hairs when young, but these fall off at maturity. The gall is usually scattered, but was found in large numbers in Shropshire in 1929 on *Q. sessiliflora* (H. J. B.). Also on *Q. robur*. July.

45. *A. glandulae* Schenck. Agamous generation. A bud gall in the axil of a leaf. Green, covered with whitish hairs. It rather resembles a rounded haystack in appearance. There are two cavities inside, the larva living in the distal one. Locally in some abundance occasionally. August. On *Q. robur* and *Q. sessiliflora*.

46. *A. lucidus* Htg. Agamous generation. It is a spherical gall covered with numerous woody projections, and is situated in the axillary leaf-buds. The only British record seems to be that of Moseley, who found the galls in 1892 in Whitley Woods, Yorkshire (see Cameron, 4 : 237).

47. *A. clementinae* Giraud. Agamous generation. A bud gall, found in the autumn, spheroidal in shape. Yellow (see Cameron, 4 : 105). There seems to be no other record for Britain.

48. *A. gemmicola* Kieff. A bud gall, mostly hidden from sight, yellowish, thin-walled, 1.5 to 2 mm. high. The fly appears in August (see Bagnall and Harrison, *Vasculum*, July, 1919). On *Q. robur* and *Q. sessiliflora*.

49. *A. furunculus* Bjek. Sexual generation of the next (see Bagnall and Harrison, *Vasculum*, July, 1919). This gall has been confused for some years with that of *N. aprilinus*, both being found

in similar buds. The gall-cell is small, 2 to 3 mm. long by 1.5 mm. across, whitish, thin-walled, oval in shape, occurring in buds on the twigs. If the scales are taken off, the gall can be disclosed, sometimes at the side of the leaf petiole, at other times so completely altering the structure of the bud that no normal growth is left. The bud is frequently distorted and twisted by the arrested growth. There may be one, two or three gall-cells in the bud. The fly is black with yellow legs which have not got the dark markings that are found on *N. aprilius*. The gall occurs in April and May, and both it and the flies have been plentiful the last two years, which has enabled a good deal of investigation on them to be carried out by Mr. J. Ross. On *Q. robur* and *Q. sessiliflora*.

50. *A. ostreus* Giraud. Agamous generation of the last. Small ovoid or spherical galls, 2 to 3 mm. in diameter, on the veins on the under-surface of the leaf. Pale yellow, marked with red spots. Sometimes all red. Some years plentiful from July to October. On *Q. robur* and *Q. sessiliflora*.

Experimental work was undertaken this year by placing a number of flies of *A. furunculus* on some young oaks in a garden, where later on the Oyster galls developed. The plants were not sleeved, so the experiment is not absolutely free from the possibilities of error, but as no galls of *A. ostreus* have ever been observed in the garden, it does point to the conclusion that these fresh galls were due to the flies introduced which had been bred from the galls of *A. furunculus*. It also shows that the work communicated to the *Entomologist*, September, 1928, by H. J. Burkill, in which *A. ostreus* and *N. aprilius* were linked together, was erroneous, and that a mistake had been made in the determination of the spring species.

51. *A. quercus-ranuli* Linn. Sexual generation. A bud gall, consisting of several small woody cells in the centre of an irregularly rounded mass of long white hairs which turn brown at maturity. Not usually common. On *Q. robur* and *Q. sessiliflora*.

52. *A. autumnalis* Htg. Agamous generation of the last. A bud gall, green to dark brown, hidden among the scales, 3 to 3.5 mm. long. Falls out in the autumn. The fly emerges two and a half years later. On *Q. robur* and *Q. sessiliflora*.

53. *A. sufflator* Mayr. Sexual generation. A flat circular pustule inside the lamina of the leaf, 3 mm. in diameter, green to brown in colour (see Bagnall and Harrison, *Vasculum*, July, 1919). Also recorded from Cumberland by Mr. L. B. Hall (*London Naturalist*, 1921). On *Q. robur*.

54. *A. trotteri* Kieff. Agamous generation. A bud gall on a short plinth on a twig, dull brown, spherical. Added to the British list by Bagnall and Harrison (*Vasculum*, July, 1919).

55. *A. aestivalis* Giraud. Sexual generation. On the catkins

of *Q. cerris*. The British record is based on a female fly captured by Cameron in Scotland. There seems to be no other British record, and we have searched many trees for it without success.

56. *A. circulans* Mayr. In the axillary buds. Oval galls 2 to 2.5 mm. long by 1.5 mm. diameter, grouped together, usually four or five cells. Pale yellowish, shining. The flies emerge in April and May. The galls have been observed by us in various places round London, and also in Yorkshire. On *Q. cerris*.

57. *A. Giraudi* Wachtl. An axillary bud gall, long-stalked, spindle-shaped, green, marked with red. Stalk 13 mm. long, gall 7 mm., and terminal spike 4 mm. A gall, apparently this species, was found in Langdale, Yorkshire, in 1905, but further search there and also in 1909 failed to disclose any more, and we have no further record for it in Britain. On *Q. robur*. The Continental distribution of the gall is "All Europe except Spain," so the species might be expected to be found here.

58. *Neuroterus tricolor* Htg. Sexual generation. A spherical whitish gall, soft and juicy, covered with short hairs, on the under-surface of the leaf. June and July. Frequent. On *Q. robur* and *Q. sessiliflora*.

59. *N. fumipennis* Htg. Agamous generation of the last. Circular disc-shaped gall with the edge turned upwards, on the under-surface of the leaf. Many galls may be massed together, overlapping each other on the leaf. Frequent. On *Q. robur* and *Q. sessiliflora*.

60. *N. albipes* Schenck. Sexual generation. An oval, pale yellow gall, 2 mm. long, on a vein, usually a lateral one in the leaf, or it may be at the base of the leaf on the mid-rib. It distorts the leaf by arresting the growth at the spot where it is. Develops rapidly. Never abundant, but seems to be well distributed, and the fly must be very prolific as the alternate form is much more numerous. On *Q. robur* and *Q. sessiliflora*.

61. *N. laeviusculus* Schenck. Agamous generation of the last. A circular disc-shaped gall with a central elevated spot. Margins thin and curved upwards. Whitish to pale reddish. On the under-surface of the leaf. Plentiful. August to October. On *Q. robur* and *Q. sessiliflora*. Also on *Q. intermedia* (*London Naturalist*, 1926).

62. *N. baccarum* Linn. Sexual generation. Spherical juicy gall, green or red. Usually on the catkins, but may be on the under-surface of the leaf. Generally abundant. May. On *Q. robur* and *Q. sessiliflora*.

63. *N. lenticularis* Oliv. Agamous generation of the last. A circular disc-shaped gall with a raised centre on the under-surface of the leaf. Pale green or yellowish with small clusters of brownish hairs springing from the surface of the gall. Generally abundant. On *Q. robur* and *Q. sessiliflora*.

Some years ago, when feeding up a number of larvae of *Lasio-campa quercus* var. *callunae* on oak, it was noticed that the larvae eat the small galls of *N. lenticularis* with the leaves, so an experiment was tried of feeding some larvae for a number of days entirely on the galls. They eat them readily, holding them in their front feet, rather after the style of a squirrel with a nut, and it was not until the supply of galls gave out that the larvae were again provided with oak and heather as food-plants. Though the substance of the galls looks very different from that of the leaves, it has no ill-effects on the larvae, which were duly bred out (H. J. B.).

(To be continued.)

NOTES AND OBSERVATIONS.

COLIAS CROCEUS NEAR LONDON.—It may be of interest to place on record the capture of a male of this species by myself on Saturday, August 13th. It was taken near the Watford bye-pass road within 1½ miles of Edgware Tube Station.—K. E. S. COLMAN; 9, Thurlow Road, Hampstead, October 10th, 1932.

COLIAS CROCEUS IN E. SUSSEX.—Mr. O. Lloyd reports this insect at Rye Harbour on September 13th, and one or two more on Rye Golf-Links.—G. V. BULL; Sandhurst, Kent.

COLIAS CROCEUS IN BERKSHIRE, WILTSHIRE AND CORNWALL.—On September 1th I took a single perfect male of *Colias croceus* near Pangbourne, Berks. One of my boys a member of our school entomological society, saw one at Reading, and another near Salisbury. Another boy, also a member of the society, took four at Hessenford, Cornwall.—Rev. C. T. EASTMAN, M.A.; "Silvesters" Preparatory School, Reading.

COLIAS CROCEUS IN SURREY.—With reference to previous records of the occurrence of *C. croceus* this year, I saw a single specimen of the insect in Ashted Woods, Surrey on August 13th last.—WILLIAM E. BUSBRIDGE; 1, Bushy Avenue, Crofton, near Orpington.

COLIAS CROCEUS AND EUVANESSA ANTIOPA IN ESSEX.—A freshly-emerged *Colias croceus* ♂ was taken about two miles from North Weald, Essex, on August 7th last. On the same day and in some woods in the neighbourhood, a *Euvanessa antiopa* was pursued without success. We obtained a close view of the insect, however, and noted its brightly-coloured borders and fresh condition. I believe that a certain London firm has, in recent summers, released numbers of this species in the country around London as an advertising stunt. Are they at it again this year?—GRESHAM R. SUTTON; 43, Reginald Road, Forest Gate, E. 7.

[With regard to the occurrence of *E. antiopa*, Mr. Frohawk's note (p. 261) is illuminating.—ED.]

IMMIGRANTS IN DORSET AND NORTH WALES.—In this locality (Llandudno), *Pyrameis atalanta* and *Plusia gamma* are exceptionally abundant, in fact I have never before seen *atalanta* in such numbers. During a short holiday in Dorset, which was attended by the most wretched weather, I saw *Colias croceus* in fair numbers, whilst *P. atalanta*, *P. cardui* and *P. gamma* were abundant throughout the district.—J. ANTHONY THOMPSON; Pan-y-bryn School, Llandudno.

LAMPIDES BOETICUS IN ESSEX.—Yesterday, October 1st, I captured a female of this species, in a slightly damaged condition, in the garden of a house in Walton-on-Naze at a flower of *antirrhinum*.—B. C. HARVEY; The Retreat, Walton-on-Naze.

POLYGONIA C-ALBUM IN SUSSEX.—I went round my garden this morning and saw four *P. c-album*. It is twenty years since I have seen them, but one was seen last September. *Pyrameis atalanta* is abundant and a few *V. io*. All are extremely fine, but I have reached the age when I enjoy seeing scarce insects on the wing—not on the pin.—H. S. THORNE; Hassocks, Sussex.

POLYGONIA C-ALBUM.—Respecting the note on p. 200 (*antea*), two *P. c-album* were captured on August 9th last by my daughter and self in W. Sussex; and on August 17th, at Rudgwick, Surrey, my daughter caught another specimen on *Buddleia*.—F. W. FROHAWK; October, 1932.

POLYGONIA C-ALBUM IN SURREY.—This morning I noticed a *P. c-album* on the Michaelmas daisies in my garden after a night of sharp frost. It was apparently quite fresh, and the species has turned up here regularly during the past four years.—B. HAROLD SMITH; Casa, Frensham Vale, Lower Bourne. Farnham, Surrey, October 10th, 1932.

POLYGONIA C-ALBUM IN EAST SUSSEX AND WEST KENT.—Mr. O. Lloyd tells me that he saw a single *Polygonia c-album* at Northiam on August 23rd; and Mr. R. Mitchison saw one in his garden at Benenden on October 10th.—G. V. BULL; Sandhurst, Kent, October 16th.

POLYGONIA C-ALBUM IN BERKSHIRE.—Last August I took three *Polygonia c-album* in excellent condition at Hound Green, near Reading.—Rev. C. T. EASTMAN, M.A.; "Silvesters" Preparatory School, Reading.

POLYGONIA C-ALBUM IN SURREY AND UNUSUAL APPEARANCE OF THE VAR. HUTCHINSONI.—Respecting the distribution of *Polygonia c-album*, my friend, Mr. Eric Parker, tells me he saw in his garden at Hambledon, near Godalming, this year, six examples. The first seen was a hibernated var. *hutchinsoni* in April. In mid-August four of the normal type were seen, and on September 29th he saw another var. *hutchinsoni*, which he watched feeding on *heliotrope*. The appearance of the var. *hutchinsoni* in both early spring and autumn is very unusual, as this variety invariably emerges only at midsummer and dies off before mid-autumn, and only the typical

dark form hibernates as a rule. The only other instance I know of the autumn emergence of *hutchinsoni* is that recorded by the Rev. Alfred Stiff in the *Entomologist*, 44:112, when four bred examples emerged in mid-October, 1910, from larvae found in September, in the Wye Valley.—F. W. FROHAWK; October, 1932.

LYCAENA CORIDON IN ESSEX.—I captured a slightly worn male *Lycaena corydon* at Childerditch Common, Essex, on August 19th this year. As I have collected in this area during the last ten years and have never seen the species here before I made inquiries at the Essex Museum at Stratford, E. The Assistant Curator was good enough to look up the references to the species in the *Journal of the Essex Field Club*. On p. 104, vol. v, 1891, there is a collected list of instances of this insect appearing in Essex, amongst which is the following quotation from a previous note by the Rev. G. H. Raynor: "Stray specimens (of *L. coridon*) have been taken at Childerditch, probably stragglers from Grays, where the species occurs regularly." Childerditch is about ten miles N.E. of Grays, and is on the southern edge of the mid-Essex heights. If the species does occur at Grays, it is probable that the one I caught was carried thence by the prevailing S.W. winds. A cursory inspection of the chalk district at Grays failed to reveal either *L. coridon* or its usual food-plant, *Hippocrepis comosa*. I should be very glad to hear from any readers who could give me any information as to the occurrence of this species in South Essex at the present time.—I. R. JENKYN; 54, South Drive, Brentwood, Essex, October 8th, 1932.

LIMENITIS CAMILLA IN EAST KENT, ETC.—I see a reference in the September issue (p. 203) to *L. camilla* in E. Kent. I have worked this Canterbury district very thoroughly for ten years now and am fairly well conversant with all localities. *Limenitis camilla* occurs in at least two localities within a radius of $2\frac{1}{2}$ miles of the city, and turned up in that very good year 1930 in a third locality. It is not, however, as common here as it is in the Ashford district. It also may be of interest that I met with *Argynnis selene* in this district for the first time in 1930. As regards migrants, *Pyrameis cardui* were very common here in 1931 on May 26th, when at least 20 were watched depositing, and many specimens were reared from the egg. In 1932 one *cardui* was seen by me depositing, on May 22nd, 12.15 noon, in the School grounds, where on October 1st of this year I took a perfect male imago of *Colias croceus* on dandelion.—W. STEPHEN JONES; St. Edmund's School, Canterbury, October 9th, 1932.

VARIETIES OF LIMENITIS CAMILLA.—During the first week of August last, while collecting in Sussex, we were surprised to find no less than eight varieties of *Limenitis camilla*, but unfortunately mostly in too worn a condition to be worth taking. My daughter, Valezina, captured no fewer than five, which varied from true *nigrina* to *seminigrina*, having the white bands more or less obliterated. I took two others of similar variation, and one other was seen.—F. W. FROHAWK; October, 1932.

EUVANESSA ANTIOPA IN SUSSEX AND "KENT" (SURREY).—The two specimens of *Euranessa antiopa* seen last August by Messrs. Collett and Potter, as recorded in the *Entomologist*, p. 223, were very probably imported examples. In any case they must be, I fear, considered as such, as may be gathered by the following. Knowing that Messrs. Samuel Jones & Co., of South London, have, during the past few years, liberated large numbers of these butterflies in and around London, and elsewhere (see *Entomologist* 64:116) I wrote them last July inquiring if they liberated any last year, and received the following reply:

"7, BRIDEWELL PLACE.

"LONDON. E.C. 4.

"12th July, 1932.

"DEAR SIR,—With reference to your letter of the 11th July, we did liberate a number of Camberwell Beauties last year, and we shall probably be receiving another supply from Germany within the next week or two.

"Yours very truly,

(Signed) "A. C. JENNINGS."

As previously pointed out in these pages, the practice of introducing foreign specimens of this butterfly for the purpose of liberation in this country is a useless and regrettable action, as it completely upsets all records of recent years relating to the appearance of genuine migrants to this country. I may add an error appears in Mr. B. Potter's note as regards his locality. The Shirley Hills, one mile from Croydon, are situated in Surrey, not in Kent as stated.—F. W. FROHAWK; October, 1932.

SPHINX LIGUSTRI TWO YEARS IN PUPA.—In regard to Mr. Frohawk's remarks under this heading in the *Entomologist* (65:210), we reared a few fine imagines of this species from ova in 1926. Five larvae pupated in the August of that year and one emerged in June, 1927; the remaining four lay dormant until June, 1928. Two emerged on June 12th, one on June 14th, and one on July 8th, 1928. The last one was in pupa for 23 months.—GRESHAM R. SUTTON; 43, Reginald Road, Forest Gate, E. 7.

EUCHLOE CARDAMINES, SECOND BROOD.—On August 17th last I saw a male *E. cardamines* on the wing at Knutsford, Cheshire.—J. ANTHONY THOMPSON; Tan-y-bryn School, Llandudno.

HESPERIA MALVAE, SECOND BROOD.—In sorting over a number of Hesperiidæ I came across a specimen of this species which I had taken at Dunyeat's Hill, near Poole, on August 2nd, 1894. This obviously represents a second brood, which is not very usual in Britain according to R. South. I have no personal recollection of seeing any other second-brood specimen in Dorset.—W. PARKINSON CURTIS; 14, Alington Road, Bournemouth.

ACHERONTIA ATROPOS AND SPHINX CONVULVULI IN EAST DEVON.—A very beautiful *A. atropos* came into the sitting-room of one of my neighbours in the village of Wilmington on September 10th. It was captured and brought to me by Miss Monica McLeod.

On October 1st another of my neighbours captured a *Sphinx convolvuli*, which she was good enough to send to me. The recent sea fogs give me the idea that both were immigrants, as I have seen none of the usual Hawk Moths here this year. I am glad also to be able to say that, in spite of the bad season, I have seen and heard of a few specimens of *Polygonia c-album* in this parish (Offwell) during these last few weeks. This species has settled itself in this neighbourhood since 1926.—S. TUKE; Colwell, Honiton.

[About the same time an *Acherontia atropos* was taken by Mr. Noel Bennett on the platform of the railway station at Witley in Surrey. Two full-grown larvae were also sent from near Farnham. The species would appear to have been rather more common than usual this year.—ED.]

ENNOMOS AUTUMNARIA WERNB. IN KENT.—During a few days spent at Bearsted (near Maidstone) brilliant moonlight militated against the attraction of moths by light. Only a single moth came into the house during the whole of my short visit, and that occurred while the eclipse of the moon was in progress, on the 14th of this month (September). But the poor attendance was set off by the quality of this single visitor, which proved to be a perfect example of *autumnaria*.—E. ERNEST GREEN.

CATAREMNA TEREURELLA, Zk., IN SURREY.—On July 30th last, the catch in my moth trap included an unmistakable example of *terebrella*, as figured in Barrett's vol. x, pl. 425, fig. 1. That author, after stating that this very local Phycid is found "sparingly, in the north of Norfolk," remarks, "so far as I know it has not yet been observed elsewhere in the United Kingdom." It has, doubtless, extended its range since the date (1905) of that publication. for Meyrick, in his last edition (1927), gives the following distribution: "Surrey to Devon, Berks, Norfolk, local."—E. ERNEST GREEN.

IMMIGRANT AND OTHER LEPIDOPTERA IN 1932.—The following notes on species observed this year may be of use to supplement those made by others. *Colias croceus* was first noticed by me on July 31st, near Brading, Isle of Wight, and has been flying in the neighbourhood in ones and twos up to the present date (September 9th). I took a worn specimen of var. *helice* on August 13th which had apparently laid all its eggs. *Pyrausta atalanta* and *P. cardui* have been fairly common in the same neighbourhood since the end of July. *Plusia gamma* has been abundant wherever I have been during the season, e. g. in the Windsor neighbourhood, near Salisbury, and in the Isle of Wight. In the last-named district it is still extremely abundant.

I can recollect no district or year in this country or on the Continent where I have not found this insect very common. In the early summer of 1917 it was flying in some numbers near the trenches at the foot of Messines Ridge shortly before the ridge was assaulted and taken. As regards other species taken during the season. *Polygonia c-album* was taken by me in the Ascot district on several occasions in the early spring; it is evidently well established there. *Leptidea sinapis* was flying in limited numbers in one of its usual haunts in the Surrey woods on June 3rd. *Agriades coridon* has been more abundant on the Downs in the Isle of Wight than I have ever seen it before in the Island. A fair number of females were taken more or less deficient of spots on the underside. In several cases spots were lacking on one side only, and I shall be very interested if anyone could give me an explanation of this peculiarity. One very large and fresh female was taken with a row of brilliant blue dots of the male colour inside the row of orange spots on the hind wings which latter were well sprinkled with blue scales. Otherwise I noticed very little tendency to blue scales in the females. The second brood of *Agriades bellargus* was also commoner in the Isle of Wight than last year. I have taken three full-fed larvae of *Chaerocampa elpenor* crawling on the foot-path in the village street of Bembridge (Isle of Wight). They evidently feed on some plant in the gardens here. *Leucania straminea* was taken in the neighbourhood of Brading Harbour, when *Coenobia rufa* was common in August flying in the sedge at dusk. *Toxocampa pastinum* was also common here at dusk at the end of July. *Rivula sericealis* has been common in August in long grass near Bembridge. In my own garden at Datchet *Plusia moneta* was taken commonly at dusk in July on flower-beds, and *Mesoleuca bicolorata* was flying in some numbers at dusk in July round apple trees in the garden. I took a series of *Pericoma flavofasciata* in woods near Datchet between May 20th and June 8th. This seems an early date for the species judging by the dates (July and August) given by South. Possibly it is double-brooded.—B. H. COOKE (Brig.-General); "Brandhoek," Bembridge, Isle of Wight.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, October 5th, 1932.—Dr. H. Eltringham, President, in the Chair.—*Election of Fellows*.—The following was elected a Fellow of the Society: R. F. Johnstone (The Royal Scots), 1st Bn. The King's African Rifles, Zomba, Nyasaland.—*Obituary*.—The death of Mr. C. T. Bowring, a Fellow of the Society, was announced.—*Exhibits*.—Mr. H. St. J. K. Donisthorpe exhibited some new and rare British beetles and made an observation on *Lycaenopsis argiolus*, attracted by the blue stone decorating a shop front in Knightsbridge. Dr. G. D. Hale Carpenter made remarks on a synaposematic association containing a hitherto unknown female Syntomid moth. Dr. Hugh

Scott exhibited some earthen cells believed to be the work of Hymenoptera, found by Major Philby, C.I.E., in a torrent bed in Nejd, Central Arabia; and on behalf of Mr. H. T. Pagden made some remarks on parthenogenesis in *Methoca ichneumonides*. Mr. Hugh Main confirmed the results obtained by Mr. Pagden as a result of experiments he had himself made some years ago. Prof. Poulton, F.R.S., exhibited (1) mimetic butterflies observed flying together at Kitale, Kenya by T. H. E. Jackson, F.E.S.; (2) further notes by W. W. A. Phillips on the insect food-preferences of a Ceylon Lemur; (3) observations by Prof. T. B. Fletcher and himself on the epigamic behaviour of butterflies; (4) a note on the colours of butterfly pupae in relation to their surroundings; and (5) the "Leopard Moth" *Zenura pyrina* bred from a larva burrowing in pomegranate at Malta by Brigadier-General T. D. Broughton. Mr. H. E. Andrewes exhibited an abnormal specimen of *Nebria xanthæra*, Chaud., from the Himalayas. Dr. E. A. Cockayne exhibited a mutation in the larva of *Pheosia dictæoides* and two unusually coloured larvae of *Anticlea berberata*. Dr. H. Eltringham exhibited some flowers of *Gloriosa superba* in illustration of the remarks made by Major Hingston in December, 1930, and published in March, 1931, *Proc. Ent. Soc. Lond.*, 5: 114-117.—S. A. NEAVE, *Hon. Sec.*

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at 52, Oakhill Road, East Putney, on September 21st, 1932, Mr. H. Donisthorpe in the Chair. Members present in addition to the Chairman: Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, Mr. W. J. Kaye. Visitors present: Sir T. Hudson Beare, Mr. K. G. Blair, Dr. M. Burr. Dr. E. A. Cockayne, Dr. F. W. Edwards, Dr. K. Jordan, Mr. M. E. Mosely, Mr. W. H. T. Tams. The meeting was called for 6.30 p.m., and the members and guests were received by the Chairman, whose collections and recent work were inspected. His method of filing notes and separata in the Orders in which most of his work has been done, which enables any reference to be found within the space of a few minutes, was greatly admired and appreciated. Supper was served at 8 o'clock, after which the Chairman made the following exhibits:—*Scopaeus abbreviatus*, Rey., a Staphylinid beetle from Hallsands, S. Devon, June 12th, 1932, new to Britain, taken by Miss Kirk and Messrs. Edmonds and Donisthorpe. The former found the first and most of the specimens. Next day Mr. Keys joined the party and more specimens were taken. Recently further captures have been made by Messrs. Edmonds, P. Harwood and Sir T. H. Beare. *Medon*, n. sp.: A specimen was taken at Hallsands, S. Devon, on June 12th, 1932, by Mr. Donisthorpe, in fairly coarse shingle. Subsequently Miss Kirk took a second specimen, and recently Messrs. Edmonds, Harwood and Sir T. H. Beare have made further captures. *Stenichnus*, n. sp.: A number of specimens were taken at Slapton Ley, June 8th-12th, 1932, in fine shingle on turf. A very pleasant and interesting evening was spent.—H. W.-E.

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NOTES ON BREEDING *ACOSMETIA CALIGINOSA*.

BY COL. P. A. CARDEW.

As recorded last year (*Entom.*, 64: 183) I obtained ova of this somewhat obscure moth, and, having successfully reared practically 100% of full-size imagines without any difficulty. I thought perhaps a few notes might possibly be of interest to those readers who have not yet tried breeding this species.

(1) OVIPOSITION.—I had, successively, four females sleeved over sprays of the food-plant (*Serratula tinctoria*). They made no difficulty about laying, but the ova were few in number, the most that I obtained from any one female being about three dozen. I found that very few ova were laid on the *Serratula*—fully 90% were deposited on the muslin of the sleeve. I have often noticed this, however, with other species, and suggest that it may simply be due to the efforts of the female to escape at the normal time of flight.

(2) OVAL PERIOD.—From 8 to 10 days only.

(3) LARVAL STAGE.—Larvae hatching on June 30th (from the first female caught on 21st) were all noted as having attained 2nd instar on July 8th, 3rd instar on July 11th. On July 25th my note is "apparently nearly full-fed." August 1st, beginning to spin up. I had several successive broods of small numbers, but all had pupated by August 16th.

(4) PUPAL STAGE.—The cocoon is of earth, of ovoid shape, and situated on or just below the surface of the soil round the food-plant. I kept the pupae as far as possible under natural conditions, but always sheltered from direct sun or rain. The winter here was mild, so that their migration from S. Hants to Yorkshire did not, apparently, affect them to any great extent.

(5) IMAGO.—In all I retained thirty pupae, twenty-nine of which emerged successfully—12 ♀♀ and 17 ♂♂. The only cripple was a male with a dwarfed left hind wing. The first insect, a female, emerged on June 20th, 1932; the last, a male, on July 4th. Six females emerged before any male appeared and all twelve females were amongst the early emergences.

Variation lies chiefly in the ground-colour of the fore wings and in the degree of clarity of the transverse markings—it is more noticeable in the male than in the female. In my captured and bred series of 30 ♂♂ and 20 ♀♀ there are roughly three classes:

(a) Ground-colour of fore wings rich red-brown with darker markings (= *lutescens* Haw.?); (b) ground-colour definitely grey with reddish shades and markings; and (c) intermediates between (a) and (b). The prevailing type appears to be (a), 22 ♂♂ and 16 ♀♀ corresponding with it, whilst (b) and (c) are represented equally, 4 ♂♂ and 2 ♀♀ falling under each of these two classes. These grey specimens hardly seem referable to *aquatalis*, Bdv. Gn., because the transverse markings are, if anything, more distinct than in the red form. In none of the grey specimens is there any tendency for the markings to become obsolete.

(6) HABITS OF THE IMAGO.—The natural time of flight is, no doubt, at dusk, but the male can generally be disturbed in fair numbers by day wherever it occurs. It does not fly far, but pitches in the long grass again like some overgrown *Crambus*. The female is not so easily discovered, and has an annoying habit, when disturbed, of threading her way low down amongst the stems of the *Serratula* and long grasses so that she is very difficult to net. When stirred up clear of the undergrowth she flies more swiftly than the male, but, like him, soon seeks cover again.

(7) In conclusion it will be seen from the foregoing that the insect is extremely easy to rear, provided that the food-plant is readily available, and I would only add that its delicate wing-structure and rather obscure markings and coloration make it essentially an insect which should be bred. I have never noticed a greater difference between captured and bred specimens than in this species.

20, St. George's Place,

York;

August, 1932

A TARIFF ON INSECTS.—I receive annually many consignments of the smaller Lepidoptera sent me from museums and students abroad for the purpose of identification. About a month ago two such consignments of considerable size reached England for me, and for the first time I received, instead of these specimens, a form requiring me to assess their value and pay customs duty on them. I entered a protest against this, setting forth my reasons, and relying especially on the impossibility of fixing any commercial value on specimens intended for scientific study. I was eventually informed that the point would be referred to the Commissioners of Customs and Excise for their decision. I have now received an official reply stating that the Board had ruled goods of this description "free as of no assessable value," and recommending that in the case of any future importations I should return the advice form, stating that the goods have been so ruled by the Board, and particularly quoting reference Bo.303319/32, which will obviate delay and inconvenience. This information may be useful also to others.—EDWARD MEYRICK; Thornhanger, Marlborough, November 5th, 1932.

NOTES ON *Polyommatus amandus* SCHN. (1792)
LEP. LYCAENIDAE.

BY CAPT. A. F. HEMMING. C.B.E.

WORK on the large series of *Polyommatus amandus* Schn. (1792) now available at the British Museum has disclosed the existence of several unnamed subspecies, of which descriptions are here given.

The north German subspecies is usually regarded (owing no doubt to lack of material) as being the same as *nomino*-typical *amandus* described by Schneider (1792) from southern Sweden. and again, in the following year, by Esper under the name *icarius*. Esper states (1793, *Die Schmett.*, Supp. Band. 1 Abschn. Tagschmett: 35) that he received his specimens from Schneider and that they were taken in the Swedish province of Blekingen. He figures only the ♂ (Schneider had given no figures), but he gives a full description of both sexes, and as regards the female, he notes that the upperside of the fore wing is of a shining blue colour. The material in the British Museum confirms his description completely. The north German subspecies, which differs materially from that from Sweden, is therefore without a name, and I name it—

***Polyommatus amandus brunhilda* ssp. nov.**

♂ *Upperside*.—Ground-colour dull blue, purpler than in *a. amandus*; black marginal border narrower than in *a. amandus*. *Underside*: Ground-colour slightly darker grey; black spotting rather heavier; orange submarginal lunules darker in colour and slightly larger; metallic blue scaling at base of wings less extensive than in *a. amandus*.

♀ *Upperside*: Ground-colour unicolorous dark brown instead of being, as in *a. amandus*, on the fore wing, blackish brown strongly suffused with bright shining blue scales and, on the hind wing, entirely blue; normally there are, on the hind wings, two or three rather inconspicuous orange lunules surmounting the submarginal spots, which are dark brown in colour and hardly stand out at all from the ground-colour (in *a. amandus* these spots are black and are entirely detached from the margin, being surrounded with the blue scaling of the ground and surmounted by very small orange patches, which take the place of the usual lunules); the fringes are dull greyish white (in *a. amandus* they are white). *Underside*: Ground-colour coffee-brown, without the greyish tinge present in *a. amandus*; on the hind wings the band of orange lunules complete and well marked (in *a. amandus* these are paler orange, smaller in size, and very small or absent in interspaces 5, 6 and 7); on the fore wings this band is also complete, though paler in colour and not strongly marked (in *a. amandus* this series is only indicated very faintly); metallic blue scaling at base of wings reduced as in the ♂.

Average length of fore wing: ♂ 17.5 mm., ♀ 17 mm. (in *a. amandus* the same).

Habitat.—PRUSSIA: Berlin, Spandau and Finkenburg near Berlin. POMERANIA: Stralsund. ESTHONIA: Lechts. RUSSIA: Leningrad.

Types.—♂ Holotype and ♀ Allotype: "Berlin, Frey Coll." (B.M. Types No. Rh. 396 ♂, 397 ♀). *Paratypes*: ♂ 1 (same data as holotype) in B.M. (B.M. Type No. Rh. 398) and ♂ 1 "Prussia, Spandau, 30.vi.1902," ♀ 1 "Prussia, Spandau, 20.vi.1901," and ♀ 1 "Prussia Finkenburg, near Berlin, 17.vi.1906, E. M. Dadd" in Hemming Coll. (A. F. Hemming Coll. Nos. 16,427, 16,428 and 16,429 respectively).

Other undescribed subspecies are the following:

***Polyommatus amandus anthea* ssp. nov.**

Differs from *P. amandus orientalis* Stgr. (1901) in the following particulars:

♂ *Upperside*: Ground-colour pale bright blue without purple tinge (the general tone of blue is nearer to that of *U. dorylus* Schiff. 1 775) than to the dull blue of most *amandus* subspecies); black marginal border (fore wings and hind wings) very narrow (narrower than in *orientalis*); fringes white.

♂ *Underside*: Ground-colour very pale grey (paler than in *orientalis*); the black centres to the submedian spots (fore wings and hind wings) and to the basal spots on the hind wings very large and conspicuous; the black chevrons surmounting the orange marginal lunules on the hind wings larger than in *orientalis*.

♀ *Upperside*: Ground-colour (which is brown in *orientalis*) is pale metallic blue (similar to that of the ♂), except along the costa of the fore wing, where it is dark brown. On both fore wings and hind wings there is a conspicuous series of bright orange interneural dashes (about 2 mm. wide). On the fore wing these dashes are separated from the termen by a dark brown band of about equal width. On the hind wings they are completely surrounded with blue scaling except towards the distal termen, where they rest upon a series of small black submarginal spots.

♀ *Underside*: Ground-colour yellowish brown, paler than in *orientalis*; a well-developed band of orange submarginal lunules present on both fore wings and hind wings (on the latter these are very large and conspicuous).

Length of fore wing: ♂ 19 mm., ♀ 18 mm.

Habitat.—Lebanon, Anti-Lebanon, and Mt. Hermon, 3000 to 7000 ft.

Types.—♂ Holotype and ♀ Allotype: "Lebanon, 7000 ft., vi.1900, Nicholl" (B.M. Types No. Rh. 399 ♂, 400 ♀). *Paratypes*: ♂ ♀ "Anti-Lebanon, 5000 ft., 1900, Nicholl" (B.M. Types No. Rh. 401 ♂, 402 ♀); ♂ 1 "Lake Phicola, Mt. Hermon, B. Lowe Coll." (B.M. Type No. Rh. 403); and in Hemming Coll. ♂ 4 "Lebanon

Ain Zehalta, 28.v.1930, *R. E. Ellison* " (A. F. Hemming Coll. No. 30,202-30,205).

This is a very striking subspecies, which may be readily separated by the bright tint of the ♂ upperside and by the blue females with wide orange borders, these characters being accompanied, on the underside, by the exceptionally heavy black spotting.

***Polyommatus amandus brenda* ssp. nov.**

Nearest to *amandus anthea* Hem., from which it differs in the following respects :

♂ *Upperside* : Ground pale blue as in *anthea* : black marginal border very narrow ; veins on the fore wing slightly outlined with black towards termen.

♀ *Upperside* : Ground-colour brown, more or less lightly washed with blue scales of the same tint as those of the ♂ upperside ; on fore wings and hind wings a band of orange yellow interneural patches, those on the fore wings being considerably smaller than in *anthea*.

♂♀ *Underside* differs strikingly from *anthea* by the great reduction in the size of the black centres to the submedian spots. These, instead of being markedly larger, as in *anthea*, are conspicuously small (smaller than in the lightly spotted ssp. *hispidis* Fruhst. (1910) from the Valais and Vaud). The basal spots on the hind wings are absent. On the fore wings the submarginal markings (clearly defined in *anthea*) are almost absent. On the hind wings the orange lunules, the surmounting black chevrons and the black submarginal spots are all greatly reduced in size. The ground-colour is paler than in *anthea*, that of the ♂ being whiter and that of the ♀ greyer.

Average length of fore wing : ♂ 17.5 mm., ♀ 16 mm.

Habitat.—Lebanon, Cedar Mountain, 8000-10,000 ft.

Types.—♂ Holotype : " Lebanon, Cedar Mountain, 22.vi.1930, *R. E. Ellison* " : ♀ Allotype : " Lebanon, Cedar Mountain, 8000-10,000 ft., end Aug., 1910, *P. P. Graves* " (B.M. Types No. Rh. 404 ♂, 405 ♀). *Paratypes* ♂ 1, " Cedar Mountain, 8000-10,000 ft., end of August, 1910, *P. P. Graves* " (B.M. Type No. Rh. 406), and ♂ 2, ♀ 3 (same data as holotype) in Hemming Coll. (A. F. Hemming Coll. No. 30,206-7 ♂, 30,210-12 ♀).

This subspecies is the high elevation representative of *anthea*, but may be readily separated from it by the great reduction in the size and amount of the markings on the underside.

PHRYXUS LIVORNICA IN SOUTH CORNWALL.—On June 16th, 1932, at about 9.45 p.m., I netted a rather worn female specimen of *Phryxus livornica* as it hovered over red campion flowers growing in a hedge-bank near the village of Cury, in the Lizard district of South Cornwall. It is the only one I have heard of this year.—A. F. O'FARRELL ; 20, Crescent Road, Wimbledon, S.W. 20.

NOTES ON THE AFRICAN HELOTREPHIDAE (HEMIPTERA
HETEROPTERA).

BY W. E. CHINA, M.A.

THE family Helotrephidae is represented in Africa by two sub-families—the Idiocorinae,* which are apparently restricted to Lake Tanganyika, and the Helotrephinae. The latter group is chiefly oriental in distribution, being represented in that region by three genera, comprising eight species. *Helotrephes* is the most widely distributed genus in the family, and the African species of Helotrephinae, based as they were on relatively few specimens, were not unnaturally referred to that genus, in spite of the fact that, as was originally pointed out,† the aedeagus of *H. hancocki* was not typical. Since that time I have received through Mr. G. L. R. Hancock, Assistant Government Entomologist in Uganda, a series of specimens of *H. hancocki*, and quite recently two specimens of Helotrephidae from another part of Lake Victoria. One of these latter is apparently a female of *H. hungerfordi* E. and C., which was originally described‡ from a single female taken by Dr. J. Decorse in the Dar Banda region of Ouibangui Chari. The other is a typical male *H. hancocki*. It was suggested, when *H. hancocki* was first described, that this species might be the wingless male of *H. hungerfordi*, but among the series of *H. hancocki* sent from Kampala were several females, so that it was possible to make a direct comparison between the two species, which are now shown to be abundantly distinct. Careful examination of these two African species also demonstrated the fact that they were actually generically distinct from the species of the oriental genus *Helotrephes* Stål. I therefore propose to establish for the African species a new genus as follows:

ESAKIELLA, gen. nov.*Helotrephes* Esaki and China, part., Eos, 1928, 4 (pt. 2): 149.

Similar to *Helotrephes* Stål in general appearance and structure, but differing in the following characters:

<i>Esakiella</i> gen. nov. §	<i>Helotrephes</i> Stål.
Rostrum short, scarcely extending beyond anterior coxae.	Rostrum long, extending to intermediate coxae.
Subgenae narrow.	Subgenae relatively broad.

* See *Trans. Ent. Soc. Lond.*, 1927, pt. ii, pp. 279-295.† *Ann. Mag. Nat. Hist.* (10), 1930, 5: 172.‡ *Eos*, 1928, 4 (pt. 2): 149.

§ This genus is respectfully dedicated to Prof. Teiso Esaki, of Kyushu Imperial University, Fukuoka, Japan, in recognition of his work on this family.

Esakiella gen. nov.—cont.*Helotrephes* Stål.—cont.

Mesosternal carina relatively small (short in profile).	Mesosternal carina well developed (long in profile).
Metasternal carina relatively long (in profile broadly truncate at apex).	Metasternal carina shorter (in profile more or less rounded at apex).
Aedeagus in male simply pointed at apex.	Aedeagus in male hammer-headed.
Dorsal paramere bent at an angle of 90° in middle.	Dorsal paramere straight.
Seventh female abdominal segment modified.	Seventh female abdominal segment relatively simple.
Ventral sclerites of eighth female abdominal segment with two distinct plates.	Ventral sclerites of eighth female abdominal segment not so specialized.

Genotype: *Helotrephes hancocki* China.

The *Helotrephes* species are relatively distinctly larger than those of *Esakiella*, usually measuring much more than 2 mm. in total length. The central sinuation of the cephalonotal suture in *Helotrephes* is usually rather narrow, whereas in *Esakiella* it is broad. Unfortunately this character breaks down in the case of the Sumatran species *H. angulatus* Ch. and *H. corporaali* Ch.

H. hungerfordi E. and C., and probably the Mascarene species *H. eremita* Horv., may also be referred to the new genus *Esakiella*.

Esakiella hancocki Ch. Fig. 1 d and e.

Helotrephes hancocki Ch., Ann. Mag. Nat. Hist. (10), 1930, 5: 172.

The right-hand elytron of female with the costal margin towards the apex dilated into a more or less distinct lobe, less prominent than in *E. hungerfordi*. The female genitalia have now been dissected, and demonstrate the fact that in *Esakiella* the seventh abdominal ventrite offers valuable specific characters. In this species it is triangular in shape with a rounded apex. The surface is convex, with an obscure swollen tubercle at the middle of base. The posterior margin of the ninth ventrite is quadrisinuate, the ventrite itself possessing a median keel.

For measurements of female see *E. hungerfordi*.

Ovum.—Similar to that of *E. hungerfordi*, see Fig. 1 e. *E. hancocki* was previously known only from Kampala, but is now recorded from Entebbe (G. L. R. Hancock, July, 1930).

Esakiella hungerfordi E. and C. Fig. 1 a, b and c.

Helotrephes hungerfordi E. and C., Eos, 1928, 4 (pt. 2): 149.

The female recently taken by Mr. Hancock at Entebbe differs from the typical specimen in several respects. It is definitely

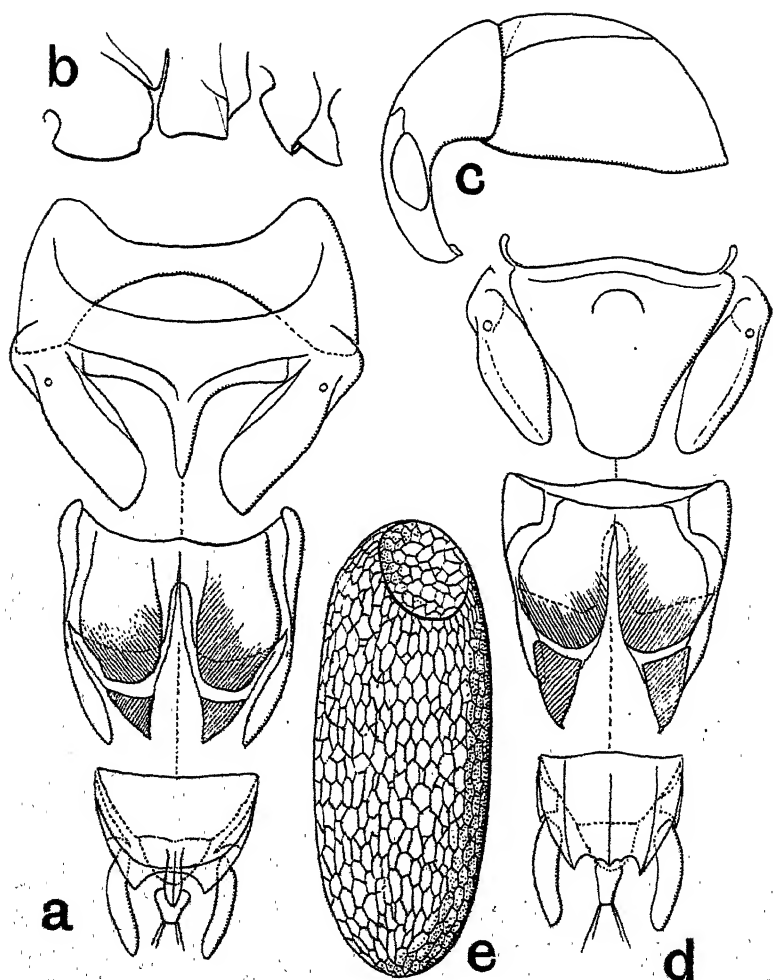


FIG. 1.

FIG. 1.—*Esakiella hungerfordi* E. and C. *a*, Ventral view of female genital segments (pubescence omitted for sake of clearness, and ventral sclerites of eighth segment shaded); *b*, lateral view of median sternal and ventral carinae; *c*, profile view. *Esakiella hancoeki* Ch. *d*, Ventral view of female genitalia (pubescence omitted and ventral sclerites of eighth segment shaded); *e*, egg dissected from female.

smaller (see measurements): in profile the head is distinctly narrower; the lateral margin of pronotum and lateral margin of head have a respective inclination of less than 90° instead of 110° (Fig. 1 c); the clavus and clavulus are absent and the wings rudimentary; the prosternal carina is sinuate at the apex instead of rounded (Fig. 1 b).

The possibility of this specimen representing a new species has been considered, but rejected on the grounds of insufficient knowledge of the variation in this group, especially in view of the fact that the colour pattern is almost identical with that of the typical form. The sternal and ventral carinae in *E. hancocki* and *E. hungerfordi* are, however, very similar, and differ only in the shape of the prosternal carina, so that a still further slight difference might indicate a new species. When more material is available this form may actually prove to be distinct from *E. hungerfordi*. In the meantime it may be referred to the latter species.

The female genitalia are similar in general plan to those of *E. hancocki*, but differ markedly in the shape of the seventh abdominal ventrite, which is modified into a sharp, strong, backwardly-directed spine. There are minor differences in the shape of the apical pair of sclerites of the eighth ventrite and of the posterior margin of the ninth (Fig. 1 a).

Measurements.—Arranged as in *Monograph of Helotrephinae* (for which see Eos. 1928. 4 (pt. 2): 135–137).

	AB.	AD	CD.	CE	FK.	GH.	LM.	NO.	PQ.	T1.	T2.		
<i>E. hungerfordi</i> (Uganda) ♀	65	26	30	46	33	20	45	28	24	17	15		
<i>E. hungerfordi</i> (Ouibangui Chari) ♀	.	.	75	27	30	53	38	23	50	37	33	20	18
<i>E. hancocki</i> , ♀	.	.	59	20	25	40	30	19	40	24	21	16	16

20 = 1 mm. (except in case of T1 and T2).

AN INLAND LOCALITY FOR *ARICIA MEDON* IN DURHAM.—For a very long time entomologists in Durham have worked to secure this insect in habitats away from the coast, hitherto without success. This year, recollecting that during the war, when on expeditions in search of old iron for ammunition purposes, I had seen the rock rose *Helianthemum vulgare* growing on the road-side near Bowburn. Mid-Durham, I determined to investigate its possibilities. When I got there I found it in less quantity than fourteen years ago, but still common enough. Unfortunately, however, the desired insect failed. Undeterred by this, I climbed over the hedge into the adjoining hilly field, when I was delighted, in spite of the changing weather and the failure of the sun, to find *Aricia medon*. Although only one specimen was brought home, enough were examined to show that the variation displayed was much on the same lines as in the coastal colonies about a dozen miles away.—J. W. HESLOP HARRISON.

GALL-CAUSING CYNIPIDAE IN BRITAIN.

PART II—continued.

BY M. NIBLETT, J. ROSS, AND H. J. BURKILL, M.A., F.R.G.S.

Concluded from p 255)

64. *N. vesicatrix* Schl. Sexual generation. A disc-shaped gall inside the lamina of the leaf, raised in the centre, and striated radially on the upper surface. Flattened below. Green, turning brownish later on. May and June. Frequent, but never massed together. On *Q. robur* and *Q. sessiliflora*.

65. *N. numismatis* Oliv. Agamous generation of the above. A disc-shaped gall with pronounced raised margin covered with silky light brown hairs. On the under-surface of the leaf. Usually plentiful, some years abundantly so. On *Q. robur* and *Q. sessiliflora*.

66. *N. aprilius* Giraud. Sexual generation. A bud gall mostly hidden by the external scales. The inner portions of the bud become fused into a fleshy mass, 7 or 8 mm. by 5 mm., containing one, two or three gall-cells. The gall develops rapidly in April and May. The situation of the gall is similar to that of *Andricus furunculus*, and the flies are also similar, so that the two species have been confused together, but if the galls are dissected out from the buds, a big difference will be seen. The gall is fairly plentiful some years. On *Q. robur* and *Q. sessiliflora*.

67. *N. schlechtendali* Mayr. Agamous generation. This is stated by Bagnall and Harrison (*Vasculum*, July, 1919) to be the alternate form of *N. aprilius*. As the gall is a catkin one, its period of development must apparently coincide with that of the suggested alternate form, which seems rather to negative the possibility of linking these two together. We have not seen this gall, but Cameron states that it is "not very common in England and Scotland."

68. *N. punctatus* Cam. Mentioned by Mr. C. Morley (*Entomologist*, 1931, p. 183) as described by Cameron from flies bred by G. C. Bignell, of Plymouth. This species is not listed in Houard. Nothing further is known to us regarding it at present.

69. *N. politus* Htg. Mentioned by Mr. C. Morley as taken in Leicestershire many years ago (see Cameron, 4 : 141). It does not seem to have been found in Britain since.

70. *Callirhytis glandium* Giraud. In the acorn, which is usually malformed with two or more cells inside it. Frequent round the west and south-west of London on *Q. cerris*. It also occurs in Kew Gardens on *Q. Lucombeana*, a hybrid between *Q. cerris* and *Q. suber*. Connold records it as on *Q. robur*.

71. *Cynipid* sp. In January, 1923, a number of old galls were found near Dorking on young oaks that do not fit into descriptions of any species known to us. They were bud galls, hard, woody, conical, curving to a sharp point. The insect had emerged in each case. The ground where they were found has since been enclosed and the public are not allowed there now. Two brief searches have, however, been made in the spring, but no more of the galls were found. On *Q. rubor*.

72. *Cynipid* sp. Bud galls on twigs. Conical, bluntly pointed, firm fleshy, embedded in scales at the lower end. Green at the base, reddish brown at the upper end: size 7 mm. by 4 mm. Found on Coldharbour Common, Dorking, June, 1930. Two *Cynipid* flies emerged a few days later and were sent to South Kensington for determination, which up to the present does not seem to have been made. On *Q. robur*.

73. *Cynipid* sp. Small globular galls 4 to 5 mm. diameter on the trunks of oaks on Cross Cliff, Yorkshire, in August, 1905. Bright red or crimson in colour. They resembled small *Trigonaspis megaptera*, but had woody walls, and also were found long after that species would have disappeared. Attempts to rear the flies failed. A short search was made on the same spot in 1921, but no galls were found. On *Q. robur*.

74. *Cynipid* sp. Smaller galls on the trunk, 1.5 mm. diameter. Spherical, unicellular, with thin walls, bright pink in colour. August, 1908. Ranmore Common, Dorking. On *Q. robur*.

75. *Cynipid* sp. A small solitary gall in the buds of *Q. cerris*, resembling *Andricus circulans*, but only one gall in each bud instead of four or five. Shropshire (see *London Naturalist*, 1930, p. 20).

76 and 77. Cameron, 4: 108, quoting Miss Ormerod, gives descriptions of two unnamed galls on oak.

78. *Cynips tinctoria* Oliv. Houard (*Les Zooecidies des Plantes d'Europe et du Bassin de la Méditerranée*) lists this species on the authority of Kieffer as occurring in the British Isles on *Q. aegilops* Linn. (No. 1895). As large quantities of these galls used to be imported into England, the insect may have emerged over here and have attacked some trees. We have no personal record of it.

NORTHUMBERLAND AND DURHAM EUPITHECIAE.—A year ago attention was drawn to the fact that careful working had shown that many species of "pug," formerly considered rare with us, actually abounded. We have continued the work this season, and have discovered that *Eupithecia succenturiata* occurs equally plentifully outside the Tyne Valley, as does *E. subfulvata*. *E. venosata*, similarly, extends westward as far as examined and eastward to Shiremoor, whilst *E. absinthiata*, not listed last year, occurred from the coast to Newburn.—J. R. JOHNSON and J. W. HESLOP HARRISON.

TRICHOPTERA. NEUROPTERA. ETC.. COLLECTED IN
THE PYRENEES.

BY MARTIN E. MOSELY, F.E.S.

DURING the past eight or nine years, holidays spent mainly in France and devoted principally to the collection of Trichoptera have resulted in the accumulation of a mass of material, little of which has yet been recorded in the entomological press. This article deals with two visits to the Pyrenees, the first in 1923 and the second in 1929. For the purposes of convenience, I have included the results obtained during a day or two at Cahors, which I visited in 1923 and revisited in 1924, and also one record made at Dax, a town in the Landes district, where I broke my journey on the way home in 1929.

Plecoptera and Neuroptera received some attention, and small collections of Ephemeroptera were also made. These last, however, are for the most part still undetermined, and, moreover, in poor condition, so that I have considered it undesirable to include them in these records.

Of special interest is a *Glossosoma* species (Trichoptera). In most of the species in this genus, in the male, there are curious callosities or membranous folds at the bases of the anterior wings, generally clothed with specialized scales or androconia. A Pyrenean species which I have not been able to separate either as to neuration or genitalia, from *vernale*, Pict., bears normal hairs in place of androconia. I have considered it desirable to record this as Pictet's species, but it is probable that a study of the internal structure of the callosity would show it to be distinct. Attention might also be drawn to the capture of a rare dragonfly, *Macromia splendens* Pict., at Cahors.

Collections were made in the following localities during the periods indicated :

Carcassonne, Aude, 16-18.vi.1923.

Quillan, Aude, alt. m. 291, 18-22.vi.1923.

Axat, Aude, alt. m. 411, 20.vi.1923.

Mont-Louis, Pyrénées-Orientales, alt. m. 1565, 22.vi-1.vii.1923.

Olette, Pyrénées-Orientales, alt. m. 607, 24.vi.1923.

Ax-les-Thermes, Ariège, alt. m. 702-736, 2-3.vii.1923.

Foix, Ariège, alt. m. 406, 4-6.vii.1923.

Itxassou, Basses-Pyrénées, 19-27.vi.1929.

St. Jean-Pied-de-Port, Basses-Pyrénées, alt. m. 168, 28.vi-3.vii.1929.

Eaux-Bonnes, Basses-Pyrénées, alt. m. 750, 4-21.vii.1929.

Eaux-Chaudes, Basses-Pyrénées, alt. m. 675, 10.vii.1929.

Bains-de-Panticosa, Huesca, Spain, alt. m. 1639, 20.vii.1929.
 Cahors, Lot, 7.vii.1923 and 29-30.vi.1924.
 Dax, Landes, 23.vii.1929.

TRICHOPTERA.

PHRYGANEIDAE.

Phryganea obsoleta, McL.—Mont-Louis.
P. minor, Curt.—St. Jean-Pied-de-Port.

LIMNOPHILIDAE.

Limnophilus rhombicus, L.—Panticosa.
L. centralis, Curt.—Mont-Louis, St. Jean-Pied-de-Port.
L. sparsus, Curt.—Eaux-Bonnes.
L. stigma, Curt.—Mont-Louis.
L. affinis, Curt.—Eaux-Bonnes.
L. griseus, L.—Mont-Louis.
L. submaculatus, Ramb.—Eaux-Bonnes.
Apatania meridiana, McL.—Eaux-Chaudes.
Stenophylax stellatus, Curt.—Eaux-Bonnes.
S. nigricornis, Pict.—Eaux-Bonnes.
S. spinifer, McL.—Mont-Louis, Eaux-Bonnes.
Micropterna sequax, McL.—Eaux-Bonnes.
Drusus discolor, Ramb.—Mont-Louis, Eaux-Chaudes, Panticosa.
Stasiasmus rectus, McL.—Mont-Louis, Eaux-Bonnes, Eaux-Chaudes, Panticosa.
Ecclisopteryx guttulata, Pict.—Ax-les-Thermes, Eaux-Bonnes.

SERICOSTOMATIDAE.

Sericostoma personatum, Spence.—Quillan, Foix.
S. pyrenaicum, Ed. Pict.—Eaux-Bonnes, Eaux-Chaudes.
Schizopelex furcifera, McL.—Foix, Eaux-Bonnes, Eaux-Chaudes.
 Itxassou, St. Jean-Pied-de-Port.
Thremma gallicum, McL.—Eaux-Bonnes, Eaux-Chaudes, Panticosa.
Silo piceus, Brauer.—Ax-les-Thermes, Foix, Quillan, Axat, Itxassou, St. Jean-Pied-de-Port.
S. nigricornis, Pict.—Itxassou, St. Jean-Pied-de-Port.
S. graellsii, Ed. Pict.—Mont-Louis.
Oligopteryx maculatum, Fourc.—Foix, Carcassonne, Quillan, Olette.
Micrasema longulum, McL.—Ax-les-Thermes, Mont-Louis, Foix, Olette, Eaux-Bonnes, Eaux-Chaudes.
M. morosum, McL.—Eaux-Bonnes, Eaux-Chaudes.
M. moestum, Hagen.—Quillan, Foix, Eaux-Bonnes, Eaux-Chaudes, Itxassou, St. Jean-Pied-de-Port.

M. minimum, McL.—Quillan, Foix, Eaux-Bonnes, Eaux-Chaudes.
Lasiocephala basalis, Kol.—Quillan, Foix, Eaux-Bonnes, Itxassou,
 St. Jean-Pied-de-Port.

Lepidostoma hirtum, F.—Itxassou.

L. fimbriatum, Ed. Pict.—Itxassou.

Goëra pilosa, F.—Foix, St. Jean-Pied-de-Port.

Crunoecia irrorata, Curt.—Foix, Eaux-Bonnes, Itxassou.

BERAEIDAE.

Beraea maurus, Curt.—Ax-les-Thermes, Foix, Quillan, Mont-Louis, Eaux-Bonnes, Eaux-Chaudes, Itxassou, St. Jean-Pied-de-Port.

B. pullata, Curt.—Mont-Louis, Eaux-Bonnes.

B. dira, McL.—Itxassou.

Beraeamyia squamosa, Mosely.—St. Jean-Pied-de-Port.

Ernodes articularis, Pict.—Foix.

LEPTOCERIDAE.

Leptocerus dissimilis, Steph.—Cahors, Carcassonne.

L. cinereus, Curt.—Itxassou, St. Jean-Pied-de-Port.

L. minor, Mosely.—Itxassou.

L. albifrons, L.—Itxassou, St. Jean-Pied-de-Port.

L. aterrimus, Steph.—Carcassonne.

L. bilineatus, L.—Quillan.

Homilia leucophaea, Ramb.—Cahors.

Oecetis testacea, Curt.—Itxassou, St. Jean-Pied-de-Port.

O. notata, Ramb.—Itxassou, St. Jean-Pied-de-Port.

O. tripunctata, F.—Itxassou.

Triaenodes ochreella, McL.—Itxassou, St. Jean-Pied-de-Port.

Setodes punctata, F.—Itxassou, Cahors.

S. lusitanica, McL.—Itxassou, Cahors.

S. interrupta, F.—Itxassou.

Adicella reducta, McL.—Mont-Louis, Eaux-Bonnes, Itxassou, St. Jean-Pied-de-Port.

A. filicornis, Pict.—Eaux-Chaudes, Itxassou.

Mystacides azurea, L.—Cahors, Foix, Carcassonne, Quillan, St. Jean-Pied-de-Port.

M. nigra, L.—Carcassonne, St. Jean-Pied-de-Port.

M. longicornis, L.—Carcassonne.

ODONTOCERIDAE.

Odontocerus albicorne, Scop.—Eaux-Bonnes, Itxassou.

HYDROPSYCHIDAE.

Hydropsyche pellucidula, Curt.—Foix, Eaux-Bonnes, Itxassou, St. Jean-Pied-de-Port.

H. instabilis, Curt.—Quillan, Foix, Eaux-Bonnes, Itxassou, St. Jean-Pied-de-Port.

H. lepida, Pict.—Quillan, Carcassonne, Cahors, Itxassou, St. Jean-Pied-de-Port.

H. brevis, Mosely.—St. Jean-Pied-de-Port.

H. ornatula, McL.—Quillan, Carcassonne.

H. angustipennis, Curt.—Carcassonne.

Dipletrona felix, McL.—Itxassou.

POLYCENTROPIDAE.

Polycentropus flavomaculatus, Pict.—Foix, Itxassou, St. Jean-Pied-de-Port.

P. intricatus, Morton.—Eaux-Bonnes.

Holocentropus dubius, Ramb.—Mont-Louis.

Plectrocnemia scruposa, McL.—Eaux-Bonnes.

P. brevis, McL.—Eaux-Bonnes.

Cyrnus trimaculatus, Curt.—Itxassou.

Ecnomus tenellus, Ramb.—Cahors.

PSYCHOMYIDAE.

Tinodes assimilis, McL.—Quillan, Foix, Ax-les-Thermes, Eaux-Bonnes, Eaux-Chaudes, Itxassou, St. Jean-Pied-de-Port.

T. unicolor, Pict.—Quillan, Eaux-Bonnes, Eaux-Chaudes, St. Jean-Pied-de-Port.

T. dives, Pict.—Eaux-Bonnes, Eaux-Chaudes.

T. rostocki, McL.—Eaux-Bonnes.

T. foedella, McL.—Foix, Itxassou.

Lype reducta, Hagen.—Foix.

L. phaeopa, Steph.—Eaux-Chaudes.

Psychomyia pusilla, F.—Quillan, Carcassonne, Foix, Cahors, Dax, Itxassou, St. Jean-Pied-de-Port.

PHILOPOTAMIDAE.

Philopotamus amphilectus, McL.—Mont-Louis, Olette.

P. montanus, Donovan.—Foix, Eaux-Bonnes, Itxassou.

P. variegatus, Scop.—Eaux-Bonnes.

Wormaldia triangulifera, McL.—Mont-Louis, Axat, Foix, Ax-les-Thermes, Eaux-Bonnes.

W. mediana, McL.—Itxassou, Eaux-Bonnes.

W. occipitalis, Pict.—Quillan.

W. subnigra, McL. —Eaux-Bonnes, Eaux-Chaudes.

Chmantha marginata, L.—Cahors, Itxassou.

RHYACOPHILIDÆ.

Rhyacophila occidentalis, McL.—Mont-Louis, Ax-les-Thermes, Eaux-Bonnes.

R. dorsalis, Curt. —Mont-Louis.

R. obtusidens, McL.—Mont-Louis, Foix, Carcassonne.

R. persimilis, McL.—Mont-Louis, Foix, Carcassonne.

R. relicta, McL.—Itxassou, St. Jean-Pied-de-Port.

R. denticulata, McL.—Itxassou.

R. fasciata, Hagen.—Foix, Axat, Itxassou.

R. contracta, McL.—Eaux-Bonnes, Eaux-Chaudes.

R. martynovi, Mosely.—Eaux-Bonnes.

R. meridionalis, Ed. Pict.—Foix, Quillan, Axat, Ax-les-Thermes, Olette, Carcassonne, Eaux-Bonnes.

R. tristic, Pict.—Quillan, Mont-Louis, Eaux-Bonnes, Eaux-Chaudes, Panticosa.

R. eatoni, McL.—Eaux-Bonnes.

R. laevis, Pict.—Ax-les-Thermes, Eaux-Bonnes, Eaux-Chaudes.

Glossosoma boltoni, Curt.—Eaux-Bonnes.

G. vernale, Pict.—Mont-Louis, Olette, Axat, Foix.

G. spoliatum, McL.—Itxassou, St. Jean-Pied-de-Port.

Agapetus fuscipes, Curt.—Mont-Louis, Foix, Ax-les-Thermes.

A. comatus, Pict.—Quillan, St. Jean-Pied-de-Port.

A. laniger, Pict.—Carcassonne, Itxassou, St. Jean-Pied-de-Port.

A. delicatulus, McL.—Foix, Itxassou, St. Jean-Pied-de-Port.

Pseudagapetus insons, McL.—Eaux-Bonnes, Eaux-Chaudes, Itxassou.

HYDROPTILIDÆ.

Ptilocolepus granulatus, Pict.—Ax-les-Thermes, Eaux-Bonnes, Itxassou.

Hydroptila forcipata, Eaton.—Carcassonne, Quillan, Itxassou, St. Jean-Pied-de-Port.

H. angulata, Mosely.—Carcassonne.

H. sylvestris, Morton.—Quillan.

H. cognata, Mosely.—Quillan.

H. femoralis, Eaton.—Quillan, St. Jean-Pied-de-Port.

H. occulta, Eaton.—Olette.

H. sparsa, Curt.—Itxassou, St. Jean-Pied-de-Port.

H. simulans, Mosely.—Itxassou, St. Jean-Pied-de-Port.

H. lotensis, Mosely.—Cahors.

Ithytrichia lamellaris, Eaton.—Itxassou.

Orthotrichia angustella, McL.—Itxassou, St. Jean-Pied-de-Port.

PLECOPTERA.

Perla marginata, Panz.—Mont-Louis, Foix, Ax-les-Thermes, Axat, Olette, Itxassou, St. Jean-Pied-de-Port.

P. cephalotes, Curt.—Mont-Louis, Foix, Quillan, Axat, Ax-les-Thermes, Olette, Eaux-Bonnes.

P. vitripennis, Burm.—Carcassonne.

Chloroperla grammatica, Scop.—Mont-Louis, Quillan, Foix, Ax-les-Thermes.

C. viridinervis, Ed. Pict.—Eaux-Bonnes, Eaux-Chaudes, Panticosa.

Isopteryx tripunctata, Scop.—Mont-Louis, Quillan.

I. torrentium, Pict.—Quillan.

Nemoura variegata, Ol.—Mont-Louis, Eaux-Bonnes.

N. sigma, Despax.—Eaux-Bonnes, Eaux-Chaudes.

N. risi, Despax.—Itxassou.

N. marginata, Pict.—Mont-Louis, Eaux-Bonnes, Itxassou.

Protonemoura meyeri, Pict.—Foix.

P. tuberculata, Despax.—Eaux-Bonnes.

P. fumosa, Ris, var. *occidentalis*, Despax.—Eaux-Chaudes.

P. intricata, Ris.—Mont-Louis, Olette, Foix, Eaux-Bonnes.

P. pyrenaica, Mosely.—Eaux-Chaudes.

Amphinemoura cinerea, Morton.—Mont-Louis, Quillan, Eaux-Bonnes.

Leuctra albida, Kny.—Eaux-Bonnes, Eaux-Chaudes.

L. kempnyi, Mosely.—Eaux-Bonnes, Eaux-Chaudes.

L. pseudocylindrica, Despax.—Eaux-Bonnes, Eaux-Chaudes, Itxassou.

L. inermis, Kny.—Mont-Louis, Quillan.

L. hippopus, Kny.—Mont-Louis.

L. despaxi, Mosely.—Eaux-Bonnes.

MEGALOPTERA.

SIALIDAE.

Sialis lutaria, L.—Mont-Louis, Panticosa.

NEUROPTERA.

ASCALAPHIDAE.

Ascalaphus libelluloides, Schaf.—Mont-Louis.

OSMYLIDAE.

Osmylus fulvicephalus, Scop.—Quillan, Olette, Itxassou, Eaux-Bonnes, St. Jean-Pied-de-Port.

SISYRIDAE.

Sisyra dahi, McL. Itxassou.

HEMEROBIIDAE.

Megalomus hirtus, L.—Axat, Mont-Louis.

M. tortricoides, Ramb.—Axat, Panticosa.

Wesmaelius quadrifasciatus, Reut.—Mont-Louis.

Boriomyia subnebulosa, Steph.—Olette.

B. betulina, Ström.—St. Jean-Pied-de-Port, Panticosa.

B. mortoni, McL.—Mont-Louis.

Hemerobius limbatellus, Zett.—Eaux-Bonnes.

H. stigma, Steph.—Mont-Louis.

H. nitidulus, F.—Mont-Louis.

H. micans, Ol.—Panticosa.

H. humulinus, L.—Eaux-Bonnes, Itxassou.

H. marginatus, Steph.—Eaux-Bonnes.

Symphorobius pygmaeus, Ramb.—Quillan.

Niremberge limpida, Navas.—Itxassou.

CHRYSOPIDAE.

Chrysopa ciliata, Wesm. (*alba* auct. nec L.).—Carcassonne.

C. carnea, Steph. (*vulgaris*, Schn.).—Panticosa.

C. 7-punctata, Wesm.—Quillan.

C. flavifrons, Brauer.—Quillan.

MECOPTERA.

PANORPIDAE.

Panorpa meridionalis, Ramb.—Panticosa, Quillan, Mont-Louis, Foix, Ax-les-Thermes.

ODONATA.

Macromia splendens, Pict.—Cahors.

NOTES AND OBSERVATIONS.

POLYGONIA C-ALBUM IN EAST SUSSEX.—An enthusiastic young collector who lives on the other side of the town reported to me that in the middle of August he took a *Polygonia c-album* at the flowers of *Buddleia*. On the morning of September 6th I saw one feeding at the flowers of Michaelmas daisies in my garden, but on endeavouring to make a closer inspection I disturbed it, and the south-westerly breeze that was blowing carried it away over the wall; however, in the afternoon it, or another, was busily engaged at the same patch of flowers. These records, taken in conjunction with others that have already appeared (Thorne, *antea*, p. 259; Bull, *antea*, p. 259, etc.) would appear to suggest that the eastward wanderings of the species have this year been somewhat more pronounced than usual.—ROBERT ADKIN; Hodeslea, Eastbourne, November, 1932.

ABERRATION OF EUCHLOE CARDAMINES.—The variety of the female of *E. cardamines* bred by Mr. G. B. Oliver in 1931 (*Entom.*, p. 237) is referable to ab. *dispila*, described by Raynor in *Ent. Record*, 18: 298, as—"Normal on upperside, but on the underside of each fore wing there is beneath the usual grey-black discal spot an oblong blotch of similar colour, and of about the same size." Adkin exhibited a somewhat similar form, but with a < mark instead of the blotch, at a meeting of the South London Entomological Society on November 26th, 1891: and Williams records a male and several females from Bexley, April, 1914. This form is fairly common in this locality, the aberrant markings varying from a faint dot below the discoidal, between veins 2 and 3, to a black wedge-shaped mark with a conspicuous linear dot above between veins 3 and 4, thus, . . . The black lines may run parallel, or coalesce to form a blotch, or again converge, making the < mark. One example of this aberration in my local series has the < mark on one fore wing and two black lines on the opposite wing.—THOMAS GREER; Milton, Dungannon, co. Tyrone, October 31st, 1932.

EGG-LAYING OF ARGYNNIS AGLAIA.—In August females of this butterfly were fairly common in the Derwent Valley, and I was fortunate enough to observe one lay two eggs. Flying down with a swoop, the female insect, ignoring the adjacent violet plants, selected a grass tuft 6 or 7 in. away, and crawling well down deposited one egg on a dead grass stalk. Next, working its way along the ground and forcing a path amongst the grass, it placed an egg well down a violet stem. Although I saw this egg laid, when I wished to show it to my friends who were some distance away I failed to detect it. The other was handed to Mr. Johnson, who duly photographed it.—J. W. HESLOP HARRISON.

A NEW OPORABIA HYBRID.—For many years I have bred hybrids between various races of *Oporabia autumnata* and *O. dilutata* for genetical purposes, in certain cases with curious results, which it is not proposed to discuss here. Just as regularly I have attempted to cross the hybrids back on the parent species, but this has proved an exceedingly difficult task, owing to the extreme sterility of the males of the two reciprocal crosses, coupled with the paucity of the males resulting from a cross between *O. dilutata* females and *O. autumnata* males. However, last season I secured a very few fertile eggs of parentage *O. autumnata* ♀ × (*O. autumnata* ♀ × *O. dilutata* ♂) ♂ and *O. dilutata* ♀ × (*O. autumnata* ♀ × *O. dilutata* ♂) ♂. From the former cross nine pupae resulted and from the latter three. Of the nine pupae, all developed until the patterns on the imaginal wings were discernible and then died, whilst of the other back-cross two of the three yielded the perfect insect—the first back-cross ever bred involving these species. Both of the insects are cripples. As far as sex is concerned, one is a genuine male, but I prefer to await the results of my dissections before stating anything about the other. As the insects are triploids it is just possible that the second one is an intersex.—J. W. HESLOP HARRISON, D.Sc., F.R.S., Department of

Botany (with Genetics), Armstrong College (University of Durham), Newcastle-upon-Tyne.

LEUCOMA SALICIS, L., IN LONDON AND THE HOME COUNTIES.—Until 1924 I had not seen this species since 1900, but in that year larvae were common at Canvey Island, where there is still a flourishing colony. About 1926 I was told that several moths had been seen in Kensington Gardens, and a male, which probably came from there, flew into my flat on July 17th. 1928. In 1929 I saw the moth at Dungeness, and in 1930 Mr. C. N. Hawkins and I found larvae at Chingford and Leatherhead. In 1931 Mr. T. R. Eagles took moths at Enfield. I think *salicis* must have become much commoner and more widely distributed in the last few years. Is there any evidence that our native stock is replenished by immigrants?—E. A. COCKAYNE; 116, Westbourne Terrace, W. 2.

DANAIDA PLEXIPPUS IN DORSET.—I saw a Milk-weed butterfly (*D. plexippus*) on the wing on Saturday, October 1st, on the cliff above Chesil Bank, near Abbotsbury, Dorset. It was flying very slowly, so that I had no difficulty in identifying it unmistakably. I could easily have taken it had I had a net.—E. H. SMYTH; Grayswood, The Downsway, Sutton, Surrey.

SOUTH'S BRITISH MOTHS.—There is a probability that the publishers of South's two volumes may be reprinting them shortly. Would every reader who knows of any errors or mis-statements occurring in these be so kind as to let me have a note of them as soon as possible, as the opportunity of making amendments may not recur for some years, and should not be missed.—N. D. RILEY; 7, McKay Road, Wimbledon, S.W. 20.

COLIAS CROCEUS, AND OTHERS, IN BERKSHIRE.—On Tuesday, August 9th, we visited a narrow valley at the foot of White Horse Hill, in Berkshire. The day was blisteringly hot, the sun was pouring directly into the valley, and its almost precipitous sides prevented the slightest breath of wind from reaching us. Almost directly we caught a fine male of *Colias croceus*, which had evidently not been on the wing for more than a couple of days, and as we penetrated further into the valley, we were surprised at the variety of species, both of butterflies and moths, which we encountered. *Melanargia galatea* and *Lycaena coridon* were in considerable numbers, the latter looking especially beautiful when settled on the flowers of the Large Scabious. We also examined the numbers of *Zygaenidae* which were feeding on these flowers, but a brief search convinced us that they were all *Zygaena filipendulae* and not *lonicerue*, as we had hoped; however, we were compensated by the capture of a pair, male and female, of the somewhat unusual second brood of *Cupido minima* both examples being in perfect condition. Finally, at the end of an hour and ten minutes we were compelled to beat a retreat, partly owing to the intense heat, and partly to lack of time, but in that brief period we had either closely observed or else had taken specimens of the following twenty Lepidoptera, a number of species which forms a record in our experience for seventy minutes' work:

Rhopalocera.—*Pieris brassicae* (plentiful), *rapae* (two or three), *napi* (plentiful); *Colias croceus*; *Vanessa urticae* (one); *Argynnis aglaja* (worn: we netted and examined a specimen, as *A. cydippe* seems to be more plentiful in this neighbourhood than *A. aglaja*); *Melanargia galatea* (plentiful); *Epinephele jurtina*; *Aphantopus hyperanthus* (plentiful, many, especially ♂♂, in very good condition); *Coenonympha pamphilus*; *Heodes phlaeas*; *Lycaena coridon* (plentiful); *Cupido minima* (several seen, two taken); *Adopaea thaumas*. Total, 14.

Heterocera.—*Plusia gamma*; *Ortholitha limitata* (worn); *Ortholitha bipunctaria* (plentiful and very fresh); *Chiasma clathrata* (worn); *Zygana filipendulae* (very abundant, mostly worn); *Hipocrita jacobaeae* (larvae swarming on ragwort). Total, 6.

We also saw two Noctuid moths, one large and flying rapidly; the other we conjectured to be *Acontia luctuosa*; the food-plant of this species, the small convolvulus, was in abundance, and the locality is one where its second brood might be expected to appear, but on the slippery grass slopes of the hill it was impossible to follow and net so elusive a moth on such a day.—H. D. and E. B. FORD.

A NEW STATION FOR *MIANA EXPOLITA*.—Whilst in search of *Aricia medon* I was extremely pleased to find that this tiny moth abounded on the roadside to which reference has been made at p. 273, and in the meadows near by. Whilst I should definitely say that *A. medon* was very much less abundant than elsewhere, *M. expolita* was much commoner than I have seen it at any time and any place. It was a great pleasure to see it skipping amongst the *Carex glauca* and the *Primula farinosa*, in the case of the males searching for resting females, and in the case of the females ovipositing on the former plant. To those interested it is important to note that the colony of the Bird's Eye Primrose is likewise new, and that it contained thousands of plants.—J. W. HESLOP HARRISON.

NEMORIA VIRIDATA IN SOUTH CORNWALL.—In late June, 1932, on a boggy heath in South Cornwall, I captured two beautifully fresh specimens, one of either sex. of this pretty little moth. Later in the same day I saw another, and subsequently found the species fairly plentiful on several other heaths in the neighbourhood. Neither Barrett nor South give any record of this species from Cornwall, but I suppose this may be due to the absence of resident collectors in the rather lonely district where I found it.—A. F. O'FARRELL; 20, Crescent Road, Wimbledon, S.W. 20.

TAENIOCAMPA OPIMA IN THE SOUTH.—In Mr. de Worms' moth-trap notes for 1931 he records four specimens of this species at Egham with the comment, "a species of uncommon occurrence in the south." The dates he mentions, viz. May 6th and 8th, confirm my impression that the species is a far commoner southern insect than is generally supposed, but is overlooked because it is later than others of its genus. It does not emerge until a date when the sallow blossoms in the south are usually over, while in the north they flower later and the species is sought for. There is rather a dead collecting

time immediately after the sallows are finished, but if some other means were adopted, such as Mr. de Worms' systematic light, or searching isolated late flowering bushes of sallow—perhaps even cloe-blossom—I feel confident the species would prove to be not uncommon and widely distributed. The late A. W. Mera took the species for years and in numbers off the dwarf sallow on Wanstead Flats, and I remember the late A. C. Battley taking it in the Theydon section of Epping Forest many years ago, also on the dwarf sallow. An illuminating experience of my own occurred at Oxshott in 1916. I had been sallowing from the beginning of the month of April down the now extinct Steer Lane (unhappily since turned into an arterial road). The blossoms proved particularly attractive, and all the species of *Taeniocampa* except *populeti* and *opima* turned up in plenty—more *miniosa* than I ever saw before or since. On April 23rd, when the blossoms were almost over and other species were on the wane, to my great surprise I took two fresh *Taeniocampa opima*. There was an isolated bush in an open field later than the rest, and one of the specimens came from this bush. I was in town the next two nights, so I asked Messrs. Carr and Green, who were staying at Oxshott, to look at the bush, and from it they took six more. On the 26th and 27th I took a further nine specimens from this one bush, although on the last night the flowers were nearly dead—so far gone in fact that the following night they failed to attract anything. I give this hint, hoping that southern collectors who want the species will try working for it at the end of April and beginning of May. If this is done, I shall be surprised if the species does not turn up in many unexpected localities.—RUSSELL JAMES; Dial House, Ongar Park, Essex.

[I also took *T. opima* on more than one occasion in Steer Lane when the sallows were practically over in 1909 and 1910.—N. D. R.]

VARIETIES OF BRITISH RHOPALOCERA.—We understand that Mr. Frohawk has a limited number of original drawings of striking varieties of British butterflies for disposal; and would be pleased to send details to anyone interested.—ED.

VANESSA URTICAE ABERRATIONS.—This species this year has been especially plentiful in one particular locality on the South Downs within 1½ miles of Lewes. Such being the case, I set myself the task of carefully examining hundreds of them on a sunny slope facing east and covered with scabious, to ascertain whether or not they varied to any extent. I was surprised to find that a very large proportion, about 35% of them, varied in the direction of diminution in size of the black spots between veins 2 and 4. Many were of the well-known straw-coloured form, and fewer still had a great preponderance of black scaling. This was manifest in such areas as the spots between veins 2 and 4, the inner border, and the decided—and in some cases heavy—shading between the middle costal spot and that on the inner margin, approaching var. *polaris*. Indeed, I had previously always noticed that in all true examples of var. *polaris* the black

spots between veins 2 and 4 were of extra large dimensions, until on September 1st I took a male *polaris* with these spots extremely small. I paid many visits to this area whenever the weather permitted, and on September 15th had the great good fortune to capture a fine female, freshly emerged, of the same form as the male of September 1st, but of a much more extreme nature. The two black spots between veins 2 and 4 are completely absent; they are replaced by a band of straw joining the straw patch between the outer two black costal areas and the usual straw patch on the inner margin of the fore wing. The fact which makes this insect even more remarkable is that it is quite heavily scaled with black in a broad band between the middle costal spot and that on the inner margin of the fore wing in a similar manner to var. *polaris*. It would be interesting to hear whether this contradictory form has been taken before, and, if so, whether it has been named.—NIGEL T. EASTON; 83, Marine Parade, Brighton, Sussex.

RECENT LITERATURE.

The Clothes Moths and House Moths; their Life History, Habits and Control. By Major E. E. AUSTEN, D.S.O., assisted by A. W. McKENNY-HUGHES, D.I.C. British Museum (Natural History): Economic Series No. 14, 1932. Pp. 56. 20 text-figures. Price 6d.

Of all the little books in the Economic Series issued by the Trustees of the British Museum, none will make a wider appeal than that on the Clothes Moths, for there are probably few British homes that have not at some time or other been troubled by the ravages of the larvae of these secretive little creatures. The Clothes Moth is no new trouble. Aristotle, who wrote more than two thousand years ago, says (*Historia Animalium*, V: 32): "Other animalcules besides these are generated, as we have already remarked, some in wool or in articles made of wool, as the *ses* or Clothes Moth.—This grub is found also in men's clothes." Even under our present-day improved conditions of living these larvae, as our author truly says, "continue impartially to attack the possessions of almost every householder," and probably will continue to do so, so long as we use wool or similar substances in any form in our houses.

The book is no hastily got together composition. For some years before his death the late J. Hartley Durrant, who had charge of the Micro-lepidoptera to which the clothes moths belong, had been making notes in the hope of the ultimate publication of such a work. Since his death his then assistant, Herbert Stringer, who now has charge of this group, has continued the good work, and has had under his notice many generations of some of these little creatures; thus a great deal of first-hand information has been gained, and the Trustees are to be congratulated on having at their disposal the services of so talented an authority as Major Austen and so ardent an entomologist as McKenny-Hughes to collate this information, and incorporate with it the result of much research that has been carried out both on the

continent of Europe and in America. Thus we have a book which is both scientifically correct and very readable, and can be easily understood by anyone of ordinary intelligence, even though he may have no technical knowledge.

The authors have done well to stress the importance of the Common Clothes Moth (*Tineola bisselliella*), for not only is it the species most commonly found in our houses, but the amount of damage that its larvae can do is not easily over-estimated. They have been known to infest bales of worsted yarn used for the covering of electric cables, rendering the yarn useless and thus causing considerable pecuniary loss; and recently they attacked the coverings of the wires in a large distribution frame in one of the London telephone exchanges, not only doing much damage, but causing considerable inconvenience (*Proc. S. Lond. Ent. Soc.*, 1931, p. 47).

The portion devoted to control is very thorough, and we commend to our readers the author's remarks on beating and brushing. If these are well carried out and a fair sprinkling of the by no means unpleasant smelling paradichlorbenzene given to our clothes when they are put away, we need have little fear of moth for some time to come; but the instructions given go far beyond such simple cases, and provide for the prevention or cure of every conceivable attack, be it large or small.

The text-figures are excellent, most of them evidently having been taken from the living creatures. *Tinea pallescentella* is the only species that does not appear to have given this opportunity, and this is hardly to be wondered at in so elusive an insect. By the way, we have most often taken this species in the winter months and have bred it in January; probably it may appear at any time of the year.

Needless to say, the general get-up of the book is all that can be desired; it contains a vast amount of useful information, and at the very moderate price at which it is published no householder can afford to be without it.

R. A

Report of the Marlborough College Natural History Society. No. 80; year ending Christmas, 1931.

Entomology does not bulk large in this volume, the report of the section occupying only nine pages. The appalling weather of 1931 and a falling off of microlepidopterists has considerably reduced the list of records of Lepidoptera, to which no new species have been added, but, on the other hand, records of other orders appear again, and, we hope, will increase in future, for in very few instances does our knowledge of these groups approach that of the butterflies and moths.

Annual Report of Eton College Natural History Society. 1931-32.

The most important entomological matter in this volume is a supplementary list of Coleoptera of the Eton district, which contains the names of a further 82 species; and there is also an interesting short account of experiences with a moth-trap. The volume is very well produced and edited, but we should like to see it numbered.

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CORRECTION.

P. 231, line 26, for *Aduria corylata* read *Clidaria corylata*.

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